

**MINING
WORLD**



One dollar per copy

**CATALOG, SURVEY &
DIRECTORY NUMBER**



APRIL 25, 1960

WEMCO World Standards in Mineral Processing...

EQUIPMENT		FEATURES	SPECIFICATIONS
	WEMCO MOBIL-MILL	Widely used for profitable production of marketable concentrates and low cost elimination of waste in treating metallic minerals, industrial minerals, coal and aggregate. Pre-engineered and pre-fabricated for maximum flexibility. Incorporates Wemco Drum type and Cone type separators for most accurate separations and highest recoveries.	Specific Gravity Range: 1.25 to 3.40 Capacity: 5 to 500 TPH Separatory Vessel: Cone, Single Drum, Double Drum, 2-Compartment Drum.
	WEMCO FAGERGREN FLOTATION MACHINE	World standard of flotation in major operations with maximum capacity per cubic foot of floor space. Rotor-stator principle gives optimum pulp circulation and aeration for high metallurgical efficiency. New air control for increased cleaning efficiency. Special feed boxes eliminate costly pumping. Minimum adjustments.	Sizes: 12" to 66" Capacity: 1 to 50,000 TPD Rotor-Stator: Rubber or neoprene covered, stainless or alloy iron. Tank: Steel, wood, stainless, cement or rubber lined.
	WEMCO SPIRAL CLASSIFIER	Slime-sand separations from 28 to 325 mesh. Single, double or triple spirals; tank options from straight side to full flare for desired settling area. Hydraulic lifting device available for starting under load without tank drainage. Sealed bearings, replaceable wearing shoes, continuous welded steel tube shaft assures long life.	Spiral Diameter: 12" to 90" Tank: Length: 6' to 48' Raking Capacity: 5 to 24,000 TPD Wearing Parts: Alloy iron stainless steel or rubber covered.
	WEMCO REMER JIG	Ideal for concentration of large tonnages of ores where specific gravity differential exists and ratio of concentration is low. Provides exclusive differential acceleration — combined high and low frequency strokes — with live jig bed over entire surface.	Type: 2 hutch, 3 hutch Sizes: 5'x11' to 5'x16' Capacity: 30 TPH to 60 TPH per unit.
	WEMCO AGITATOR-CONDITIONER	For fast, homogeneous agitating, mixing and blending. High intensity Fagergren type mixer-blender for reagents, other material with poor solubility characteristics. Propeller type available for conditioning flotation pulp, reagent mixing or blending. Certain parts interchangeable with Wemco Fagergren Machines. Turbine agitators also available for special applications.	Sizes: High intensity type cell sizes 2 cu. ft. to 100 cu. ft. Propeller type, tank sizes 2' to 20' diameter. Wearing Parts: Alloy iron, stainless rubber or neoprene covered.
	WEMCO ATTRITION MACHINE	Efficiently removes stubbornly adhering coatings from mineral particles. Widely used to remove iron from silica sand for glass manufacture. Provides intensive scrubbing action of particle on particle in high density pulps and slurries.	Rubber covered impellers and liners or abrasion resistant steel and ni-hard reduce maintenance to a minimum.
WEMCO PUMPS			
	WEMCO SAND PUMPS	Handles pulps of sands, abrasive solids, slimes, slurries and heavy media; pumps flotation feed, concentrates and tailings. Used for HMS circuits, screen products and grinding mill discharge to classifiers. Change of wearing parts made readily.	Sizes: 1 1/4" to 8" Capacity: 20 GPM to 2200 GPM Discharge Head: Up to 100 Ft. Pulps Handled: Up to 65% solids, particles up to 1"
	WEMCO VERTICAL SAND PUMPS	Provides performance of Wemco Sand pumps with added vertical application. Used for clean-up duty installed over sump or on cross members without need for separate dry pump pit. Can be mounted inside flotation concentrate launders for pumping concentrates.	Sizes: 1 1/4" to 4" Capacity: 20 GPM to 500 GPM Pulps Handled: Up to 65% solids, particles up to 3/4"
	WEMCO TORQUE-FLOW PUMP	New principle incorporates recessed impeller, continuous open passage. Permits pumping of large solids and tramp material in slurry without clogging. Wear is reduced since only small portion of slurry comes in contact with moving parts. Handles slurries with higher solids content than conventional pumps.	Sizes: 2"x2" and 3"x2" to 8"x8" and 10"x8" Capacity: 50 GPM to 2500 GPM Head: Up to 100 ft. Construction: Ni hard for abrasive service.

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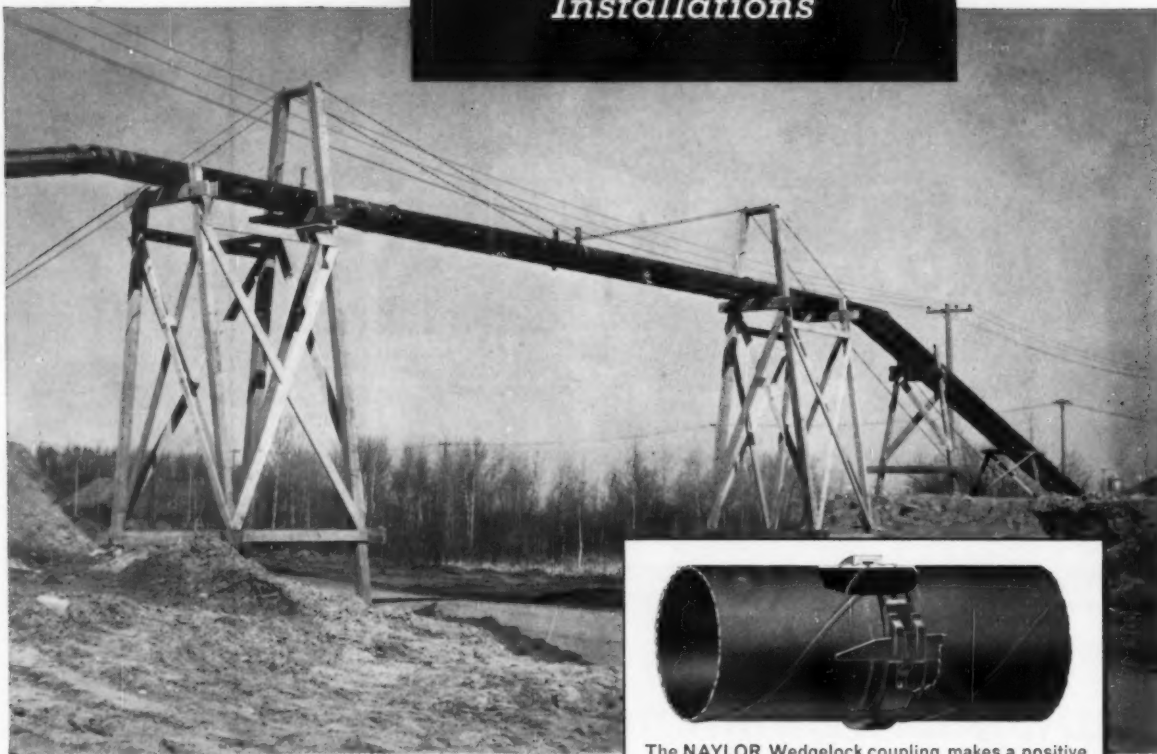
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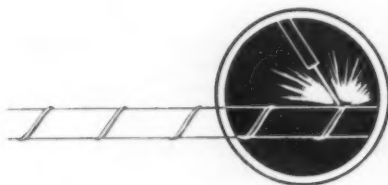
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ON THE COVER

Smelting in the 15th Century. From an original German wood block print. Check the Blue Ribbon section to see the equipment used today.

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MILLER FREEMAN PUBLICATIONS



Giant Lima 2400 dragline equipped with 7-yd. bucket moves an estimated 3000 yd. in 9-hr. shift.

7-yd. LIMA dragline works 19 hours daily; maintenance less than \$50 in 2 years!

"The Lima 2400 dragline is the best equipment buy we've ever made. It recovers about 500 tons of coal a day, working a 10- and a 9-hour shift. Yet maintenance costs in 2 years have amounted to less than \$50."

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"I checked before I bought the Lima—for my money, Limas are bigger, heavier and better built than comparable rigs of other makes. From wide, heavy duty brake and clutch bands to shock-reducing torque converter, the 2400 is designed to outwear, outlast and outstrip other machines on the market."

"I was impressed by the field service that the factory engineers provided in adjusting the new machine for me. They also saw to it that my operators

were thoroughly familiar with the 2400. Both parts and service from factory and distributor are excellent. We also have a Lima Type 34 Paymaster. Both Limas have proven to be high performance, low maintenance machines." *From a report by the Harold A. Siegel Coal Co., Clarion, Pa.*

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NEW 5-YD. LIMA LOADER digs, scoops, swings and loads from stationary position; no waste motion. Fast, economical way to handle bulk materials.

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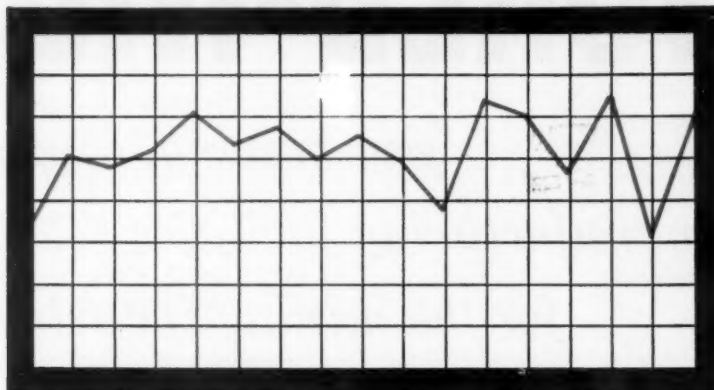
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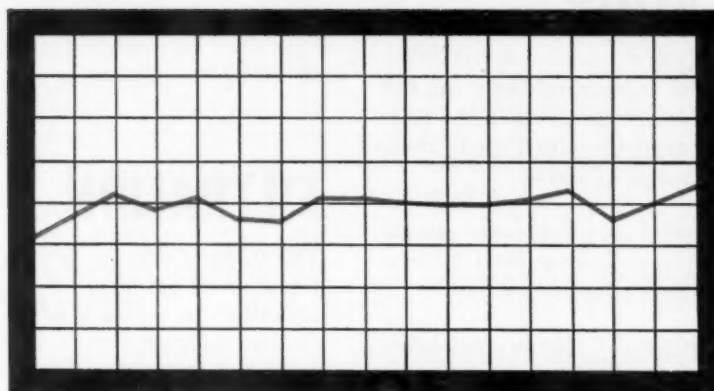
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WORLD-WIDE

*engineering, equipment
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for the mining industry*

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The Dorr Classifier . . . first machine to put classification on a continuous, mechanical basis and still the standard unit for wet separations in the 28 to 200 mesh range. Now available with Type H mechanisms in a complete range of sizes.

The Dorr Bowl Classifier . . . incorporates standard machine with shallow, circular bowl for separations in 65 to 325 mesh range.

The Dorr Hydroseparator . . . for large volume flow or exceptionally fine separations.

The Dorrco Jet Sizer . . . multiple-spigot, hindered-settling classifier featuring low operating cost and extreme flexibility of cell arrangement.

DorrClone* Classifier . . . a complete range of wet cyclones in diameters from 10 mm to 48 in. . . both single and multiple unit installations.

DSM Screen . . . for high capacity screening in the 8 to 100 mesh range . . . gravity fed wedge bar design in standard sizes from 1 to 4 ft. wide. Features high efficiency with low installed and operating cost.

THICKENING

Dorr Thickeners . . . center shaft, center pier and traction units in a wide range of types and sizes to handle every thickening or clarification problem. Individual units available to handle from one to

25,000 tons of solids in feed per day. Can be arranged in trays for counter-current washing, parallel thickening or a combination of both in a single unit.

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The Oliver Filter . . . first machine to put vacuum filtration on a continuous basis and still the standard filter for washing cyanide slurries. Available in sizes ranging from 3 to 790 sq. ft. of filtering area and with a variety of discharge methods depending on cake characteristics.

The American* Filter . . . ideal for dewatering slurries which form relatively thick cakes. Features big savings in floor space and can be compartmented to filter two or more products on the same machine.

The Dorrco Filter . . . low maintenance unit where filtering takes place on the inside of the drum which also acts as the filter tank. Especially suited for dewatering fast-settling solids such as magnetites, lead sulfides, etc.

The Oliver Horizontal Filter . . . capable of counter-current washing in a single unit. Ideal for relatively slime-free slurries which form thick cakes.

The Sweetland* Filter . . . a quick opening batch pressure filter with individual sight glass on each leaf. Good for leaching operations and where % solids in feed is insufficient to form a dischargeable cake on a continuous unit.

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Dorrco FluoSolids* Systems... over 120 units now in operation indicate complete acceptance of advanced technology embodied in D-O's fluidized system for gas-solids reaction. For roasting sulfides for metal recovery, for SO₂ production for acid manufacture, for roasting gold ores prior to cyanidation, for heat treatment steps in the concentration of various ores.

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The ODS Diaphragm Slurry Pump... variable volume pump from zero on up. Discharge can be shut off while pump is running. Operates on compressed air with no mechanical linkage. Ideal for dense slurries.

Dorrco V-Type and W-Type Pumps... for positive, controlled removal of settled solids from Thickeners and Hydroseparators. Can be used as meters ahead of further treatment.

FOR FURTHER INFORMATION

Literature detailing the different types of Dorr-Oliver equipment and its application to specific operations is available through any of the offices and associated companies listed at right.

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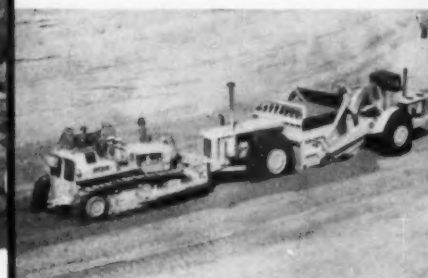


EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



At a coal stripping operation in Pennsylvania, this TC-12 removes overburden at a rate of 400 to 500 yds. per hour. It is equipped with 16' blade...works two 8 hr. shifts a day.



Euclid Twin-Power teams — TC-12 Crawlers and TS-24 Scrapers — move over a million yds. a month at this Wyoming open pit uranium operation.



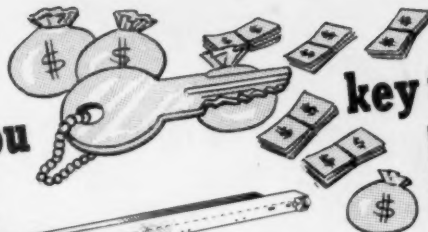
Model C-6 crawler back-filling overburden in the pit...full-power shift, good visibility and fast response make this "Euc" a high production machine for mine and quarry work.

EUCLID Division of General Motors
Cleveland 17, Ohio

Plants at Cleveland and Hudson, Ohio,
and Lanarkshire, Scotland.

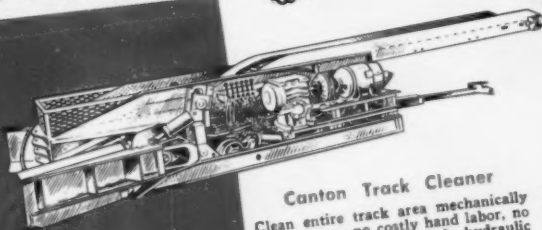
"Canton"

... Gives you



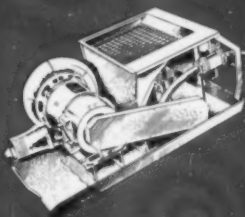
key to the money vault!

Help yourself to unlimited profits with equipment that opens up new areas of increased savings ... performs prodigiously over long, long periods of time, pays for itself in unbelievably short time.



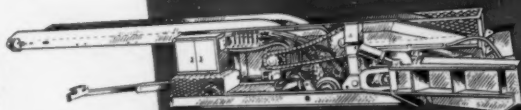
Canton Track Cleaner

Clean entire track area mechanically in one pass—no costly hand labor, no dozers or loaders required—hydraulic controls throughout. "Pays for itself in one sweep through mine." Now used in coal, iron, copper, lead, potash, and salt mines.



Mighty Midget Duster

Weighs only 280 lbs. Easily moved on shuttle car. Hand cart available. Ideal for small mines—inexpensive—capacity 7 tons dust per shift.



Dustmaster

The track mounted Hi-pressure "Dustmaster" is the most powerful Duster ever built. Distributes dust to back areas 500 feet from haulway.



Little Chief for Wet Or Dry Dusting

Rubber tire model 22 1/4" high—skid model 18 1/4" for shuttle buggies, belts or mine cars; hydraulic self-propelled model available. 34 to 60 lbs. dust per minute through 50 to 250 ft. of 2" hose.



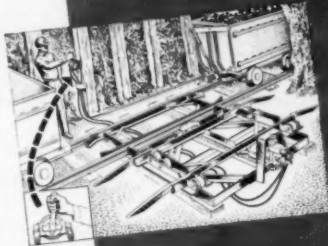
Manually Operated Car Transfer

No alterations to track—quickly installed and relocated—less rib to shoot than for jump switch—no hazards of cherry picker, anti-friction bearings for easy hand operation.



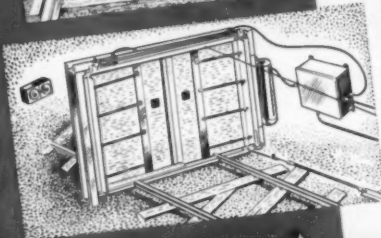
Air Power Car Transfer

One man does the work of three and faster. Entire train loaded out on a single track. Expedites servicing cars to mucking machine.



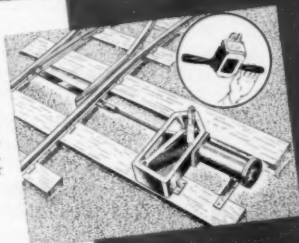
Canton Automatic Mine Doors

The Automatic Door operates mechanically by weight of car on activating levers. Air power operation may be had where desirable. Operates at any trip speed. Two doors provide air lock.



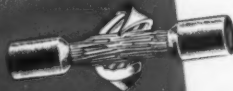
Track Switch Thrower

Either electric or air operated. Route selections made by motor-man at full trip speeds. Eliminates accident potential and extra man. Also ideal as Derailer. Manual or automatic contactors available.



Canton Cable Splicers

Reduce down-time in splicing cable. Machine man should carry a pocketful. Just pound around cable and keep on working. No special tools required.



Remember you can install a "Canton" now and pay us out of savings. Write for complete brochures. Please use street and zone numbers.

the American Mine Door Company
2071 DUEBER AVENUE, S.W. CANTON, OHIO



At Keystone Portland Cement Company's Bath, Pa., quarry, this Mack LVX takes on one of the fifty 22-ton loads it must haul each day to keep on schedule.

A 15% grade has to be tackled on the mile-long round trip from shovel to crusher. This Mack hustles up-grade with a full payload while its empty companion barrels back down to the shovel.



Our MACKS stay on the job

Round-the-clock feeding of the crusher is one phase of cement-plant operations that can't fall behind.

Keystone Portland Cement Co., Bath, Pa., expect each of their trucks to deliver 800 tons of rock per 7-hour shift ... and do it at lowest cost. They get the job done with Mack 22½-ton LVX dumpers—fast, reliably and with surprising fuel economy.

Quarry Superintendent Harry Michaels says, "Our Macks give us top on-the-job performance, taking time off only for

routine maintenance. They keep working day after day, month in, month out."

Why not team up *your* big shovels with Mack trucks? They'll make fast hauls between quarry and crusher. They can be depended upon to meet scheduled tonnage requirements because Macks don't bog down or break down when the going gets rough ... handle easily the heaviest loads under the most demanding conditions.

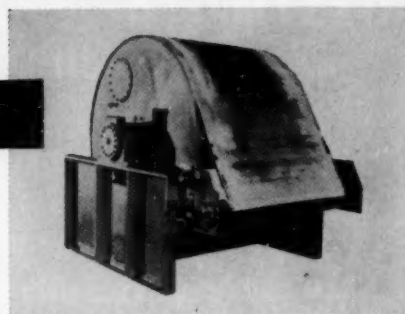
Whatever your requirements, your Mack branch or distributor has full de-

tails on the Mack off-highway dumper that will do the job better and more economically. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd., Toronto, Ont.

MACK
FIRST NAME FOR
TRUCKS

EIMCO Equipment for:

Liquid-Solids Separation Through Vacuum and Pressure Filtration

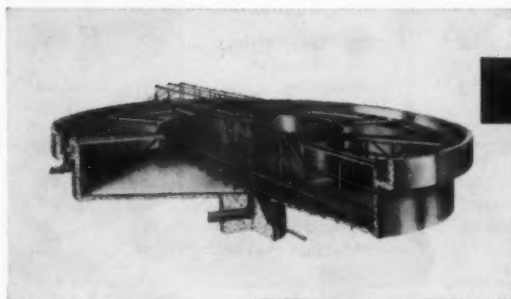


Newest filter in Eimco's complete line of Drum, Precoat, Disc, Pressure, Tilting Pan, Top Feed and Pressure Plate filters is the EimcoBelt, a new filter developed by Eimco for the filtration of difficult slurries.

The EimcoBelt is the first successful continuous belt drum filter. The filter medium is removed from the drum every filter cycle for cake discharge and washing of medium. Blinding is eliminated. Even glutinous slurries, or slurries having low density solids, can be

filtered continuously, with no fall-off in filtration rate caused by blinding. In several processing operations, the EimcoBelt has eliminated the need for a clarifier.

All Eimco vacuum and pressure filters are built in a complete range of sizes for any application. Bulletin F-2049, describing Eimco equipment for filtration, may be obtained from the Eimco representative in your area, or by writing Eimco Export, 51-52 South Street, New York 5, New York, U.S.A.



EIMCO Equipment for:

Liquid-Solids Separation Through Gravity or Flotation Clarification

Another example of Eimco's pioneering in the field of liquid-solids separation is the Flotator-Clarifier, developed by Eimco's Process Engineers Division.

The Flotator-Clarifier removes low specific gravity solids by combining dissolved air flotation and conventional sedimentation in a single tank. An initial separation of light materials by flotation makes possible a faster settling rate for solids removed by sedimentation. Removals equivalent to those of a conventional

clarifier can be obtained in about half the tank area.

Eimco-Process equipment includes Thickeners, Reactor-Thickeners, Hydroseparators, Slurry Mixers, Air-Lift Agitators, Lime Slakers, Water Purification Systems, Complete small plants for Sewage or Wastes Disposal. For more details, contact your local Eimco representative or write Eimco Export Department, 51-52 South Street, New York 5, New York, U.S.A.

Eimco's Research and Development Center contains unexcelled facilities for laboratory and pilot-scale testing in connection with any liquid-solids separation problem. Your processing requirements can be pre-tested before investments are made in full-scale equipment.

"ADVANCED ENGINEERING AND QUALITY CRAFTSMANSHIP SINCE 1884"

THE EIMCO CORPORATION

**EXPORT OFFICE: 51 - 52 SOUTH STREET, NEW YORK, N. Y.
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STRESS
ABRASION**

AMSCO® ALLOYS

In addition to austenitic manganese steel castings—long known for their exceptional service life in mining, construction, quarrying and milling applications—Amsco now offers *seven* other ferrous alloy materials. These include specially alloyed manganese steels, chrome moly steels, high strength alloyed steels and alloyed cast irons.

Each has particular advantages for specific service requirements, involving various combinations of impact, stress and wear. Check the brief facts on these alloys below. Then call in an Amsco sales engineer to assist in selecting the *one best* material to meet your application needs.

AMSCO ALLOY DESIGNATION	DESCRIPTION AND USES	MECHANICAL PROPERTIES
MY	Heat-treated, chromium alloyed manganese steel... for use in light-to-medium weight castings requiring modest improvement in growth and distortion, and increased stiffness.	tensile strength 120,000 psi yield strength 56,000 psi elongation 45% reduction of area 30%
MML	Heat-treated, molybdenum alloyed manganese steel... for castings requiring improved weldability, for extremely heavy metal sections, and castings exposed to excessive heating environments.	tensile strength 120,000 psi yield strength 52,000 psi elongation 50% reduction of area 40%
MMH	Heat-treated, molybdenum alloyed manganese steel... for use in castings requiring optimum mechanical properties and wear resistance. Provides improved stiffness and resistance to peening and flow.	tensile strength 120,000 psi yield strength 65,000 psi elongation 20% reduction of area 18%
CML	Heat-treated, air-hardening chrome-moly steel... for casting applications involving scouring or grinding wear. Suitable for more complex casting designs.	tensile strength 155,000 psi yield strength 130,000 psi elongation 10% reduction of area 15% hardness 275-375 BHN
CMH	Heat-treated, air-hardening chrome-moly steel... exhibits potentially improved wear resistance over CML (above), when shock loading is not sufficiently severe to cause breakage.	tensile strength 155,000 psi yield strength 130,000 psi elongation 6% reduction of area 7% hardness 300-400 BHN
CS	Martensitic, multiple alloy steel with chromium, nickel and molybdenum... combines high mechanical strength with good abrasion and wear resistance.	tensile strength 220,000 psi yield strength 195,000 psi elongation 8% reduction of area 20% hardness 300-500 BHN
HC	High chromium cast iron... provides outstanding abrasive wear resistance, where impact force is low but particle velocity and scouring forces are high.	tensile strength 60,000 psi transverse strength 7,000 lbs. deflection 0.12 in. hardness 400-600 BHN

For further information
—write for technical bulletin on
“Amsco Ferrous Alloy Castings”.

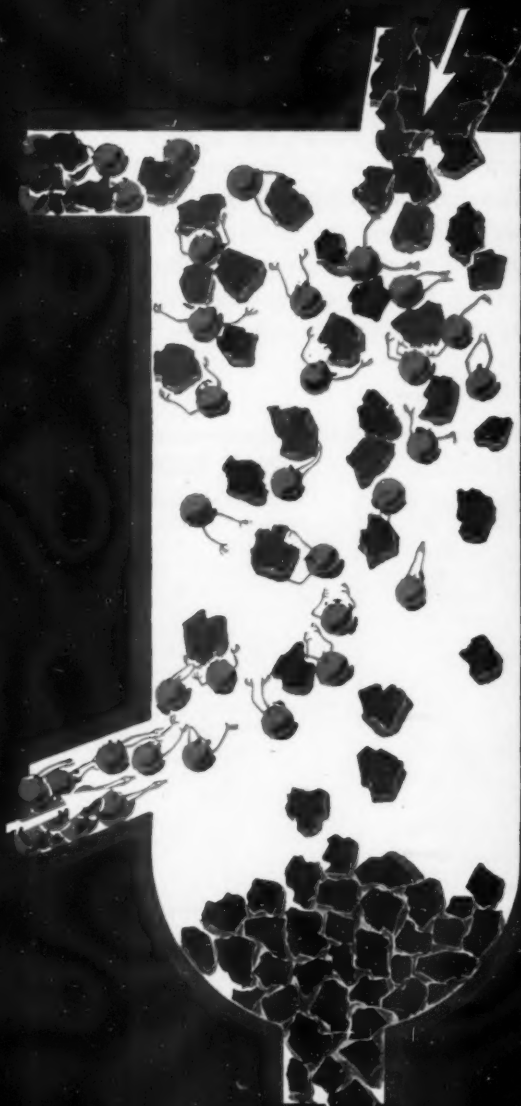


AMSCO

American Manganese Steel Division • Chicago Heights, Illinois
Other Plants in: Denver • Los Angeles • New Castle, Delaware • Oakland, California • St. Louis
In Canada: Joliette Steel and Manitoba Steel Foundry Divisions

KNAPSACK-FERROSILICON 15% ATOMIZED

FOR HEAVY MEDIA SEPARATION



Helps reduce costs and increases operating efficiency by:

1. Reducing corrosion

The spherical shaped particles of atomized ferrosilicon offer maximum resistance to corrosion due to their smooth, hard surface. There are no sharp-edged corners which are particularly susceptible to rusting.

2. Reducing „drag-out“ or adhesion losses

Atomized Ferrosilicon particles are easily separated from the ore and gangue by spraying on the rinsing screens, eliminating high losses due to adhesion.

3. Reducing pulp viscosity

The ball-to-ball contact of the atomized ferrosilicon particles minimizes mutual adhesion, reducing the pulp viscosity.

Because of the reduced pulp viscosity, the feed can be increased to give a more dense pulp for sharper separations. Specific gravities up to 3.9 are attainable.

4. Reducing wear on equipment

Atomized ferrosilicon, due to its rounded surface, materially reduces wear on pumps, piping, etc.



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AKTIENGESELLSCHAFT

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A complete electrical supply service for mining and refining

Electrical equipment and supplies to meet the special needs of the mining industry are an important part of Graybar's all-inclusive service. Located at or near leading mining centers, Graybar offices and warehouses serve as prompt local supply sources for the

products of over 300 leading manufacturers. Graybar Representatives in these areas are well informed on underground or above-ground service requirements. Specialists on wiring, lighting, communication, and power apparatus are ready to help you.

430

ELECTRIC CABLE

GRAYBAR offers a complete line of wire and cable for power distribution, for mining machinery and locomotives, shot firing, signaling, and other specialized needs.



Simplex mining machine cable has tough outer selenium-neoprene armor to stand up in mining service.



Tirex shot-firing cable combines flexibility and light weight with high strength.

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General Electric motors and controls, meeting Bureau of Mines or Underwriters Laboratories requirements for hazardous areas, are available via GRAYBAR as a part of our power apparatus service. Ilg ventilating fans and blowers of all types are also available for mine use.



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U.S.I. Mine Telephones are sound-powered . . . require no batteries or external power supply. They transmit speech clearly over lines of any length. Supplied for either code or selective signaling up to 24 stations. U.S.I. Mine Telephones carry Bureau of Mines Approval No. 905.



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GRAYBAR "Victor" tape is a widely used favorite. Weather-proof sockets, fuses, circuit breakers, panel boards, switches, and terminals are among the many additional wiring supplies distributed by Graybar for electrical systems above ground or below.



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Lamps and lighting equipment offered via GRAYBAR include explosion-proof, vaporproof and other specially protected types. Also a full line of floodlights for outdoor service, fluorescents for offices and drafting rooms. Our portables and flashlights are listed by Underwriters Laboratories for Class I, Group D conditions.



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ELECTRIC CO., INC.

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KRUPP

No rocks are too hard

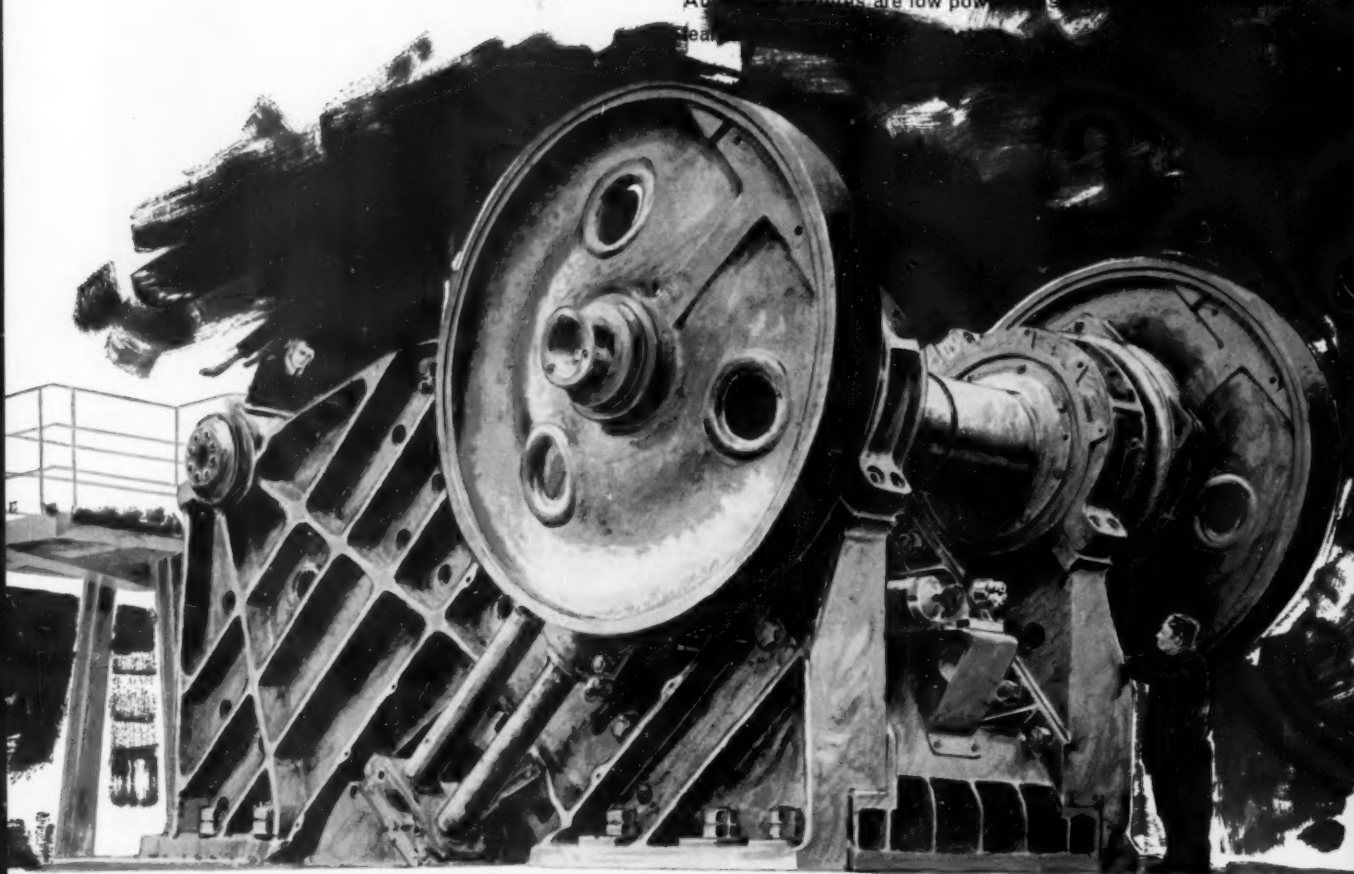
for KRUPP percussion crushers (German and foreign patents). They have proved their excellent features in several hundreds of plants on crushing rocks of the hardest types of any description, ferro-alloys, cement clinker, ores and similar raw materials, as well as coal, coke, lime, etc.

The novel way of function enables high ratios of reduction and large throughputs.

The overload protection may be adapted to actual operational resistance. It is a safety device of high importance and prevents damages and stoppages by unwanted

Additional features are low power

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For information, please contact Krupp International Inc., 375 Park Avenue, New York 22 N. Y.



SIDE DUMP BUCKET

tips right, left, and straight forward

It's always cheaper to turn the bucket, not the tractor, when dumping material or loading trucks. That's why the three-way dumping action of the Libu bucket can save precious seconds and cut operating costs to a minimum.

The Libu bucket is available in a variety of sizes for both light or heavy-duty loading applications, and fits any model of Caterpillar® tractor without modification of machine or bucket. Under tough digging conditions, the Libu bucket offers outstanding penetra-

tion and breaking capacity. A new design, with built-in cylinder provides maximum unloading height; however, the Libu bucket can be dumped from any height below the maximum level, making it useful for conveyor belt loading operations.

Delivery includes: bucket and support with built-in side dump cylinder and tip lock; all hydraulic tubing for connection with the original Caterpillar® hydraulic system for front attachments; a foot-operated control valve; and a warranty.

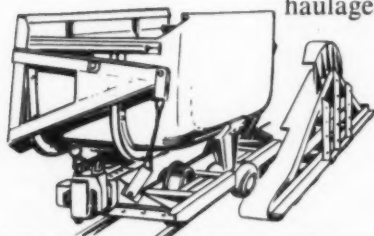
Sturevägen 18, Stocksund, Sweden
Cable: Libushovel, Stockholm

LIBU SHOVEL CO AB

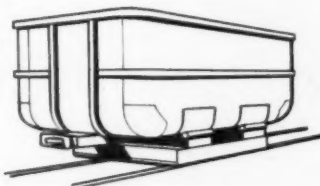
FOR YOUR PRODUCTION HAULAGE



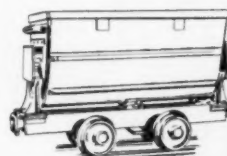
Our shops are known the world around for custom building of mine cars and other haulage equipment. Note this partial list of customers, many of whom have placed several repeat orders, indicating continuing satisfaction. Card can fit your needs economically. Our engineers are available for consultation on your haulage problem. No obligation.



Granby Type Car & Dump Block



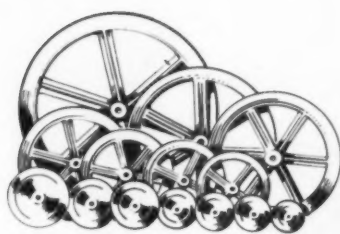
Telluride Type Car



Rocker Dump Car



Type Z Car



Standard Heavy Pattern Rope Sheaves



Spring Mounted Bolster Truck



Bicycle Spoke Sheave

Roller Bearing Track Rope Roller

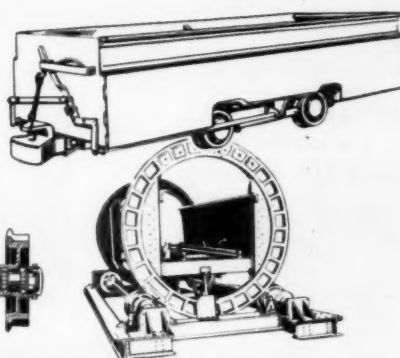


Card Curve Sheave



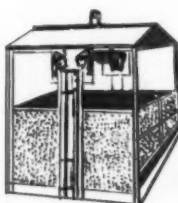
Card Timken Bearing Truck

All Steel Rotary Dump Car

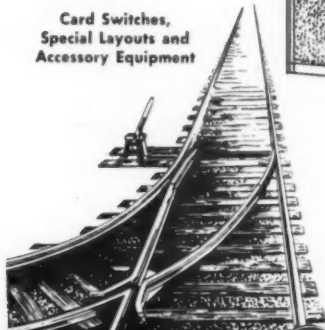


Power Driven Rotary Dump

Card Cages



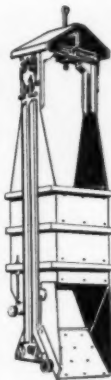
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Kimberley Type



Bottom Dump

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INTERNATIONAL MINERALS
PHELPS DODGE
KENNECOTT COPPER
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U. S. POTASH
MAGNA COPPER
PHILLIPS PETROLEUM
KERMAC NUCLEAR FUELS
HOMESTAKE
STANDARD URANIUM
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CANANEA CONSOLIDATED COPPER
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SUNSHINE MINING
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SMELTING CO. OF CANADA
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RUBBER-LINED PUMPS

HYDROSEAL VERTICAL sump pump



Brochure
No. 757

RUBBER-LINED or ALL-METAL.
Four sizes: 1½" to 6"
Slurry, Sand & Dredge

To have an easy key to the correct type and size of pump, write us for "Technical Data" Brochure No. 357. For information in the category of your need, use the specified number. In the refinements of application, our engineers can help you.

METAL PUMPS

PACKLESS Pumps

No stuffing box
No packing
No mechanical seal
No liquid seal
No exposed metal parts



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Capacity range:
25 to 800 GPM

Technical Data

HYDROSEAL
CENTRISEAL
PACKLESS
CENTRIFUGAL PUMPS

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INTERCHANGEABLE

HYDROSEAL operates with sealing liquid



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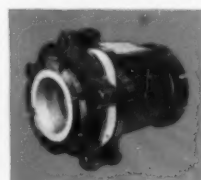
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2" to 14"

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CENTRISEAL delivers the pulp undiluted

Flex-Check Valves RUBBER-LINED



For pipe diameters up to 12"
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Capacities up to 14,000 GPM
Efficiency up to 75%

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THE ALLEN-SHERMAN-HOFF PUMP CO.

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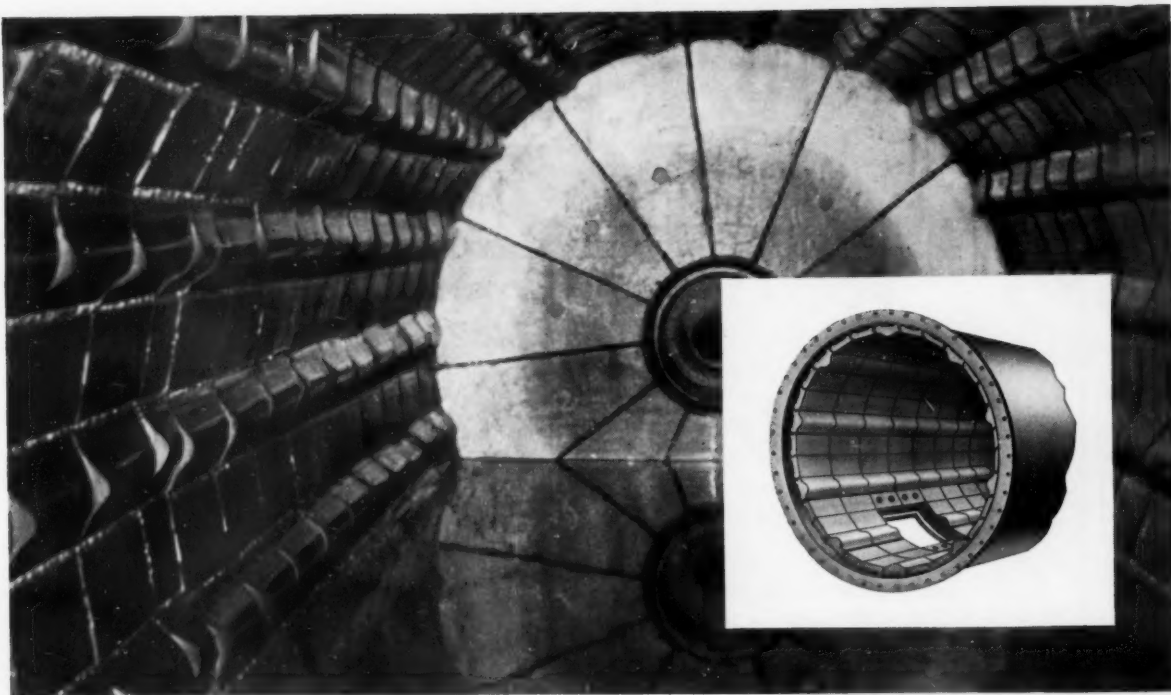
Representatives throughout the World



HYDROSEAL and CENTRISEAL

SAND, SLURRY & DREDGE PUMPS

MAXIMIX RUBBER PROTECTED



8

Reasons Why You Should Standardize with B&W Universal Liner Plates

Better Performance with Lower Costs— Same Casting Fits All Mill Sizes

B&W Tube Mill Liners reduce capital, time and labor costs. Consequently, they reduce the cost of the material ground. Here are eight reasons why:

1. Lower Initial Costs—standardization eliminates chiller and pattern costs.
2. Longer Life For Liners—better quality control on a mass production casting, utilizing permanent molds, results in uniform wear. Ideal size for uniform chill and heat-treatment.
3. Longer Life for Different Applications—this is assured by selection of proper materials. Design is suitable for either chilled irons or wear steels.
4. Reduced Costs in Both Direct Labor and Outage—installation time is less because small size and weight of castings allows them to be handled easily, without cranes and with less fatigue for workers.
5. Reduces Costs in Storage Space—because small castings stack easily, little storage space is required. One design of casting interchangeable for all size mills also simplifies records.
6. Reduced Costs in Liner Inventory—standardization is possible because one design fits all diameters of mills. Standardization means quicker unloading and storage.
7. Reduced Costs on Breakage Claims and Delays for Replacements—small castings are rugged and almost impossible to break by handling. Large castings of hard, brittle irons sometimes break in shipment.
8. Reduced Costs in Determining Most Efficient Wear Patterns—you can get wear profiles consisting of all lifter ribs or all flats from the same castings, as well as a combination of both including straight or spiralled lifter pattern.

Liners are supplied in two nominal thicknesses, 1½" and 3" with 1½" high lifters. Castings are 6" wide x 12" long. Positive seating of small castings on mill shell means less breakage of castings under operating conditions. For additional information on B&W Universal Tube Mill Liner Plates write The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.



B&W

THE BABCOCK & WILCOX COMPANY

BOILER DIVISION

S-471

**THE
ALL-NEW**

SUPER PIONEER MARK IX

PORTABLE DIAMOND CORE DRILL

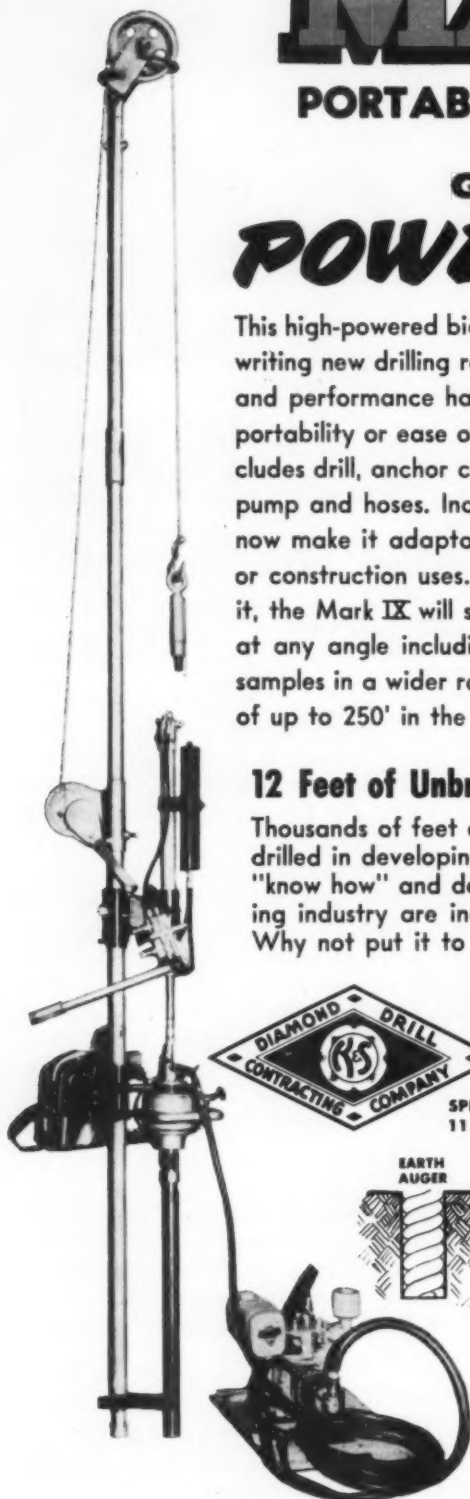
GIVES YOU

POWER TO SPARE!

This high-powered big brother of the famous Super Pioneer is writing new drilling records wherever used. Power, capacity, and performance have all been doubled without sacrificing portability or ease of operation. Total weight of 170 lbs. includes drill, anchor column, hydraulic feed, mast, winch, and pump and hoses. Increased power and optional gear ratios now make it adaptable to all types of mining, engineering, or construction uses. Rugged, lightweight, and built to take it, the Mark IX will set up or tear down in minutes, will drill at any angle including up-holes, and will deliver true core samples in a wider range of sizes than ever before in depths of up to 250' in the hardest of rock formations.

12 Feet of Unbroken Core From 200 Feet in Depth!

Thousands of feet of test holes in all types formations were drilled in developing and perfecting the Mark IX. All of the "know how" and dependability of over 60 years in the drilling industry are incorporated in this "package of power". Why not put it to work for you!



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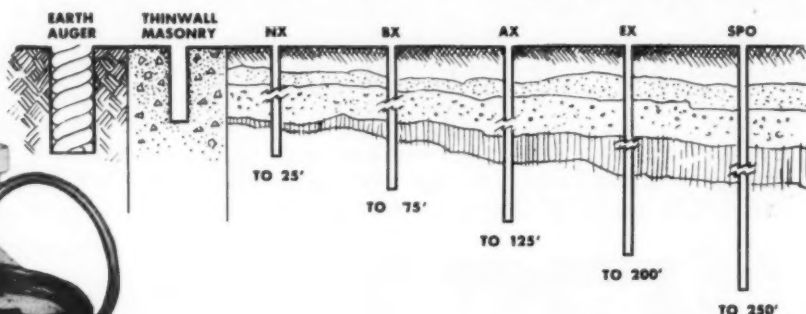
Spokane, Washington, U.S.A.

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**Easy Operation—
High Production
From C-W Performance Features**

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C-W SERVICE A worldwide network of distributors and strategically located parts depots assure Curtiss-Wright users of fast, efficient service on any job location.



CW-226—26 CU. YDS. STRUCK



CW-220—20 CU. YDS. STRUCK



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CW-28—8.2 CU. YDS. STRUCK



CW-320—20 CU. YDS. STRUCK



CWD-221—35 TON CAPACITY



CWD-214—25 TON CAPACITY



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CWT-30—30 CU. YDS. STRUCK



CWT-8—8 CU. YDS. STRUCK



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Five self-propelled scrapers with capacities from 8 to 26 cu. yds. struck, up to 36 cu. yds. heaped . . . Three interchangeable rear dumpers with 25 and 35 ton capacities . . . Six tractor-drawn scrapers with capacities from 8 to 30 cu. yds. struck, up to 39 cu. yds. heaped . . . A total of 14 high-performance machines covering the complete range of practical earthmoving applications.

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CORPORATION
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**Weight
96 lbs.**



300
**Gallons Per Minute
at 25 Feet**



WEDA L3Z

**Submersible Drainage Pump Features
Built-in Overheat Protection Device**

The new Weda L3Z pump weighs only 96 pounds, yet has a very high maximum capacity which exceeds 350 gallons per minute. If abnormally high operating temperature is caused by incorrect voltage, phase breakage, running dry for too long, incorrect direction of rotation, blocked impeller, clogged strainer, etc., the new inherent Overheat Protection

Device will automatically stop the pump. Immediately after the pump has cooled down to normal operating temperature, and the fault has been corrected, the Overheat Protection Device will restart the pump. This system is so efficient that the ordinary motor protector is not necessary. Wire, write or phone for complete information.

- * Fully submersible—motor completely protected
- * Cannot burn or be overheated
- * Heavy duty—handles over 30% solids
- * Salt water resistant—frost proof
- * Selfpriming—no suction line
- * Wear resistant—consistent capacity

- * Continuous operation with minimum attention
- * Top Head at 100 feet—can easily be coupled in series
- * 6 H.P. motor for 220/440 or 550 Volt, 3 phase, 60 cycle A.C.
- * Patents pending

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HEAVY DUTY HYDRASTROKE[®] FEEDER

for MINES and MILLS

**A Reciprocating High-Tonnage Feeder
easily adapted to feed Belts, Trucks,
Skips, Railroad Cars, Screens and
Crushers**

PATENT APPLIED FOR

**Exclusive
HYDRAULIC
OPERATION**

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Exclusive hydraulic power drive supplies the fluid to a cylinder which reciprocates the deck. Fixed or variable feeding rates are easily available through the use of a fixed or a variable volume pump. Length of stroke can be varied from 6 to 24 inches.

MINIMUM HEAD ROOM

Head room requirements are reduced to as little as 20 inches. Impact damage is minimized because discharge lip of feeder is only 6 to 8 inches above lowest clearance line of feeder. Initial construction costs are reduced.

ROCKER MOUNTING OR SUSPENSION

May be installed with either rocker suspension or self-contained rocker mounted units. Eliminates costly wear due to friction which is present in other types of feeders. No lubrication is needed. Feeder can take severe shock loading.

Durability characterized by **special rugged construction**

Wide range of sizes available . . . widths from 36" to 96" . . . feeding capacities from 300 to 7500 tons per hour.

Write for illustrated brochure.

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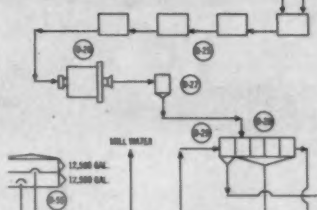
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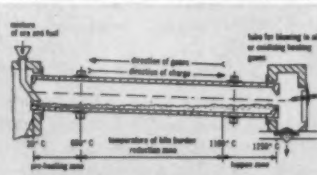
LABORATORY ORE INVESTIGATION determines the best-suited ore-treatment process, guides mill and plant design.



FLOW SHEET DEVELOPMENT shows each processing step in proper sequence, indicates economic feasibility before major investment is made.



KRUPP RENN PROCESS, represented exclusively by Sweco in the U.S., directly reduces lower grade and refractory iron ores in a rotary kiln.



HEAVY-MEDIA-SEPARATION makes possible profitable treatment of many ores. Sweco builds complete heavy media separation plants.



VIBRO-SCREEN SEPARATORS are efficient screening classifiers used throughout the mining industry in many ore beneficiating processes.



PLANT DESIGN, ENGINEERING AND CONSTRUCTION SERVICES of SWECO were utilized by National Lead Company in their lead, zinc and copper concentrating plant high in the Argentine Andes.

GETTING THE MOST OUT OF YOUR ORE

Profitable ore treatment is the objective of all operators of milling plants. SWECO engineers, technicians and craftsmen have been helping mining companies reach this objective for more than 40 years. This experience extends to every known type of ore and to the far corners of the world... from laboratory investigation and flow sheet development, to the complete design, construction and operation of ore beneficiating plants... from small-scale pilot operations, to massive installations. *To get the most from your ore, call on this SWECO experience.*

LITERATURE AVAILABLE ON REQUEST:

- SWECO Engineering and Construction Services, Bulletin MC-6
- SWECO Ore Investigation Services, Bulletin MC-7
- SWECO Krupp Renn Plants, Bulletin MC-8
- SWECO Heavy-Media-Separation Plants, Bulletin MC-9
- SWECO Vibro-Screen Separators, Bulletin MC-10

40 years of service to the mining industry



Southwestern Engineering Company
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Dependable testing equipment

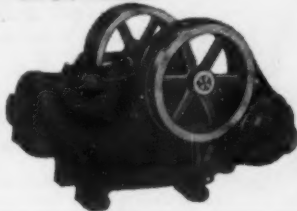
Melting, refining, processing, production—all begin with accurate, uniform *testing*. Denver Fire Clay products and equipment have been serving the testing field for 84 years, efficiently and economically—and this is your assurance of accurate, trouble-free testing year after year after year.

Write for full information about any of the products on this page. Other DFC quality products include fire brick and special shapes, refractory specialties, industrial furnaces, burners, and incinerators.

DFC LABORATORY CRUSHERS

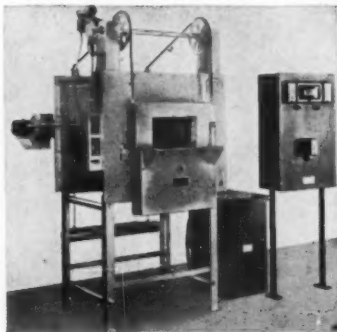
**Fast — Rugged —
Economical**

For reducing ore, rock, or brittle substances from 2½ to ¼ inches in diameter or smaller, at rates of 50 to 150 pounds per hour.



DFC ELECTRIC ASSAY FURNACES

Accurate — Dependable



Rugged open-hearth-type furnaces, designed and built for accurate, uniform assays, and greatest return on your money. Fast-heating, U-shaped, nickel-chrome heating elements are supported in specially designed refractory blocks—insure maximum heat reflection. Furnace lining is backed with high and low-temperature insulating brick. Entire unit is encased in

welded steel jacket. Wide doors provide easy access to crucibles. Indicating-controlling-type pyrometer insures absolute, constant control of temperature and atmospheric condition for cupeling.

Available in two models which offer a choice of automatic or manual control. Capacity: thirty-five 20-gram or twenty-four 30-gram crucibles. Also gas and oil-fired assay furnaces.

for 83 years...

DFC METALLURGICAL CLAY GOODS



DFC Clay Goods—crucibles, annealing cups, muffles, trays, roasting dishes, scorifiers and ignition dishes—are world renowned for quality and dependability.

DFC CRUCIBLE MELTING FURNACES

Fast — Efficient

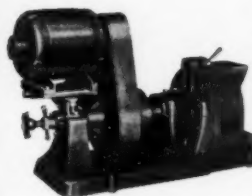
Designed for continuous operation to 2200° F., and extensively used for melting gold, silver, cyanide precipitates, brass, and other non-ferrous metals. Stationary types are available in seven models, to accommodate seventeen crucible sizes, ranging from #30 (282-cubic-inch capacity) to #400 (3,765-cubic-inch capacity). Manual tilting types are also available in seven models, to accommodate sixteen crucible sizes, ranging from #40 (377-cubic-inch capacity) to #400.

Burner systems are adaptable to gas or oil-firing. Design simplicity insures easy maintenance.



DFC PULVERIZERS

Disc-Type — Direct Drive



Perfect companions to DFC Crushers. Medium quartz ore can be reduced from ¼ mesh size to 100 mesh at the rate of 1.4 pounds per minute. Any degree of fineness up to 120 mesh is obtained by turning a hand size-wheel at the rear of the machine, and a lock nut holds any adjustment.

SAMPLERS

Available in sizes from 5 by 4½ inches to 18 by 10½ inches hopper-top. Jones Pattern Samplers also available.



DENVER FIRE CLAY COMPANY
3303 Blake Street, Denver, Colorado

Please send literature on:

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ORDERED BY _____ TITLE _____

ADDRESS _____

DF 9-9

Denver Fire Clay Company

DENVER • SALT LAKE CITY

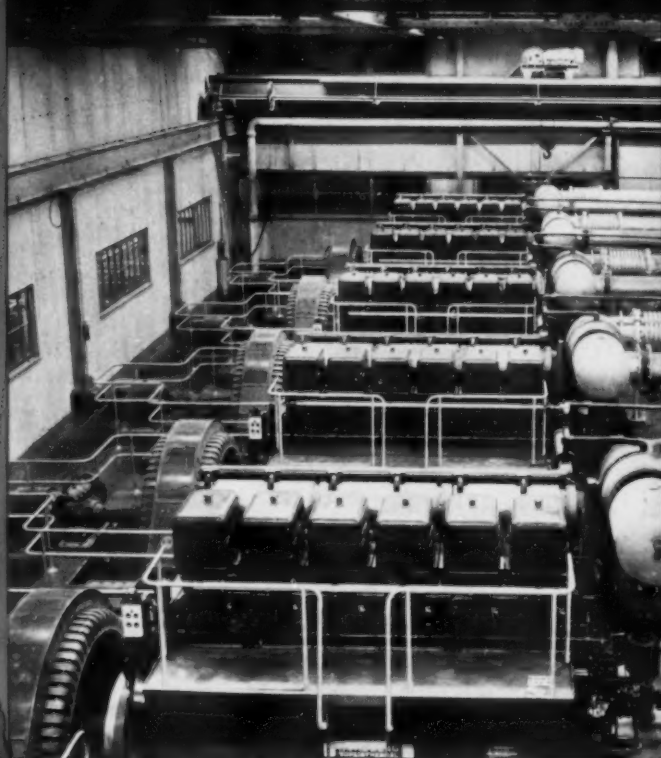
HOW NORDBERG MACHINERY SERVES THE MINING INDUSTRY

NORDBERG MFG. CO.
Milwaukee 1, Wisconsin



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Known Throughout the World.*

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY
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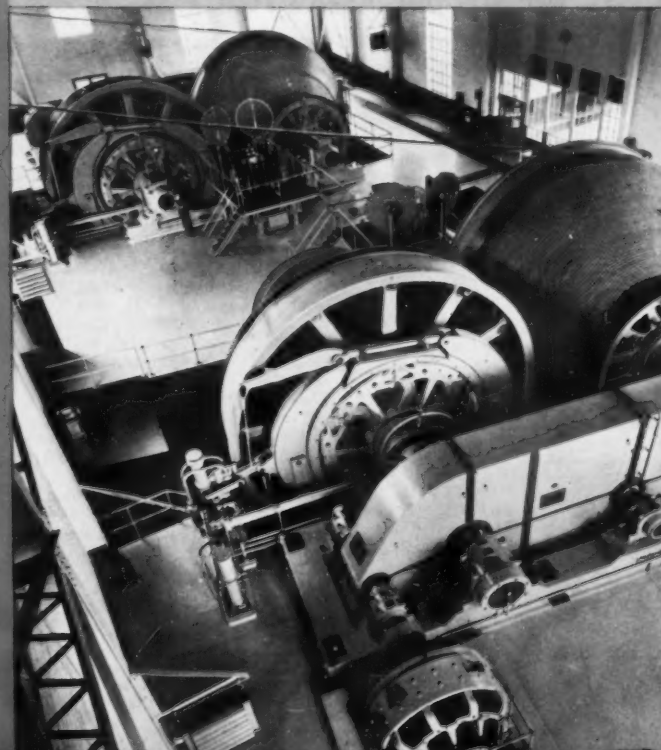


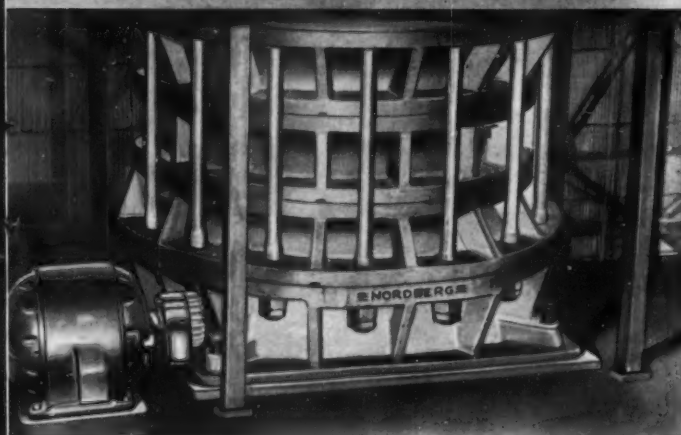
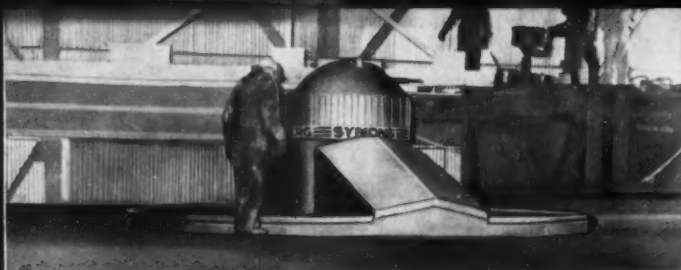
IN POWER GENERATION

Nordberg engines are built in sizes ranging from small power units to over 12,000 horsepower in a single engine . . . and are available for Diesel, Dualfuel® and Spark-Ignition Gas operation.

IN HOISTING

Nordberg has an established reputation second to none, and can furnish both conventional and friction type mine hoists for men and material, to meet specific requirements.



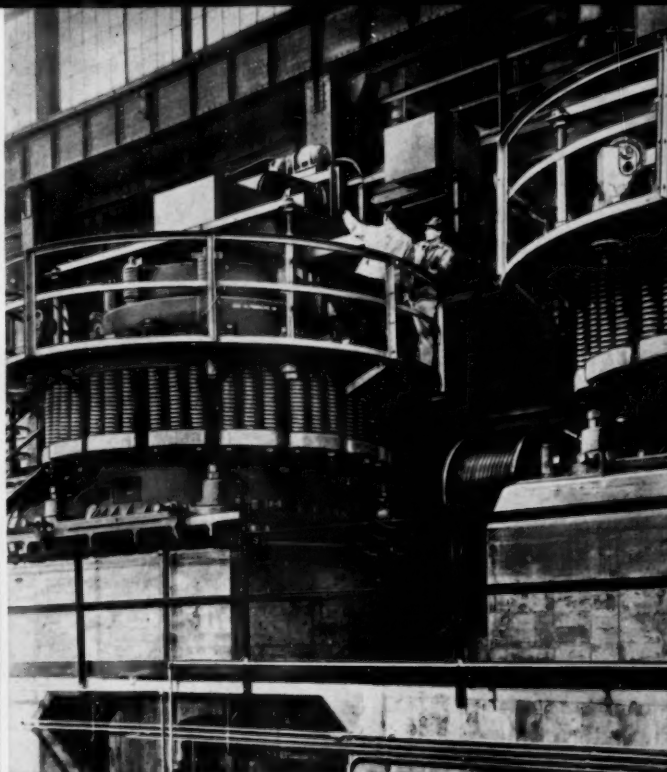


IN PRIMARY CRUSHING

Symons® Primary Gyratory Crushers are built for big tonnage, heavy duty primary breaking in 30", 42", 48", 54", 60" and 72" feed opening sizes. Capacities to 3500 or more tons per hour.

IN SCREENING

From scalping to fine screening, there is a Symons Screen built to do a better job at low cost. Let Nordberg experience help you select the screen best suited to your needs.

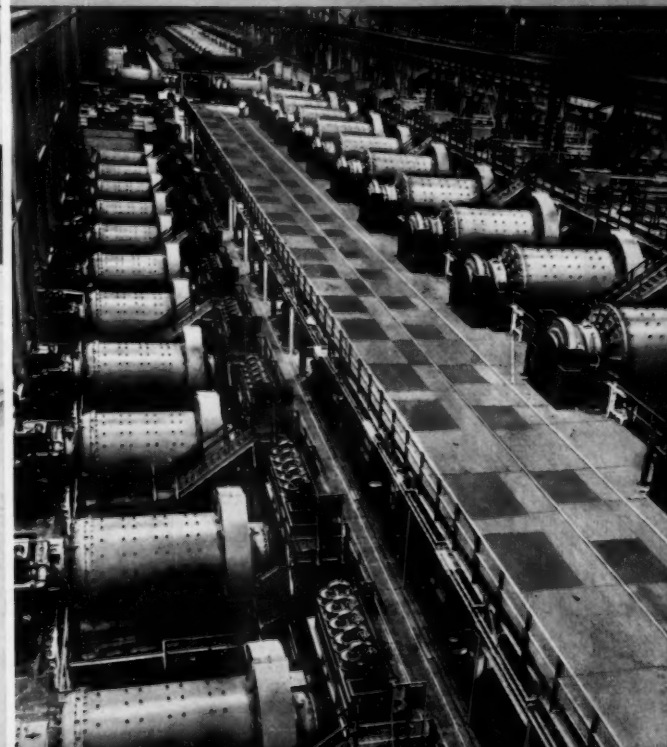


IN FINE REDUCTION CRUSHING

Symons Cone Crushers, the machines that revolutionized crushing practice, are built in both Standard and Short Head types, in sizes from 22" to 7' in diameter. Capacities from 6 to 900 or more tons per hour.

IN WET AND DRY GRINDING

Nordberg Grinding Mills include Rod, Ball, Pebble, Tube and Compartment types, in sizes from 6' to 13' in diameter and up to 50' in length.



THE BETTER WAY

The P&H way—"the better way" of design and construction puts P&H Electric Shovels in a class by themselves—they alone are not essentially the same as the shovels of a generation ago.

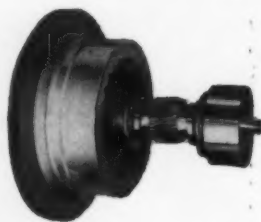
P&H has always been the pioneer developer of dramatic new designs and processes—this is why P&H Electric Shovels incorporate design fundamentals which make them different from all others. By their pioneering, P&H found "the better way" to production premiums as high as 10%, lower unit cost and more net profit for P&H owners.

Some exclusive P&H design fundamentals not found in other electric shovels are:



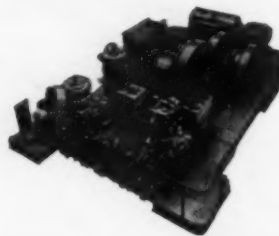
1. ELECTRONIC CONTROL

This patented P&H control accomplishes the quickest work motion reaction time known for electric shovels. Control maintenance expense is reduced as much as 80% by elimination of all moving parts for a completely closed circuit system.



2. MAGNETORQUE® HOIST DRIVE

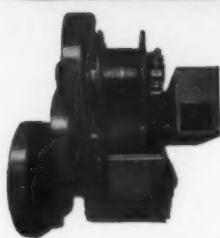
This patented hoist drive electro-magnetically transmits the full digging power of an A.C. motor direct to the dipper without motor generator set conversion to D.C. current! It gives up to 30% higher bail pull for more uniform digging speed and greater dipper fill factor.



3. FULL WELDED STEEL CONSTRUCTION

P&H was the originator of electric shovel construction by the unit welded rolled steel method. Their accumulated wealth of experience pays P&H owner dividends in the form of exceptional long shovel life in hard digging—accomplished by full welded steel construction.

P&H is now the world's largest builder of full-electric and diesel-electric shovels. Only P&H manufactures their own electrical as well as mechanical components—designed specifically for electric shovel service—gives you the service assurance of single source responsibility.



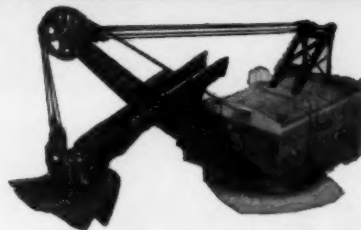
4. ENCLOSED HOIST MACHINERY

Only on the P&H Shovel is all deck machinery—the power trains for hoist, swing and propel drives—enclosed in oil tight gear cases. No open gearings! Modern power train design at its best!



5. INDEPENDENT CRAWLER PROPEL MOTOR

Only P&H Electric Shovels have an independently motored crawler propel drive. P&H gives shovel owners the advantages of independent motoring—the basic principle of electric shovel design and purpose. The P&H is FULL-ELECTRIC in every work motion.



6. T-1 STEEL...SHOVEL ATTACHMENT

Only P&H furnishes as standard a boom and dipper handle fabricated of ultra high strength T-1 steel for high impact absorption ability, especially important in sub-zero temperatures. P&H pioneered and is the most extensive user of rolled alloy steels.

HARNISCHFEGER

Milwaukee 46, Wisconsin



P&H Electric Excavators: 3½ through 10 yds.
LINE: Diesel Excavators: ½ through 3½ yds.
 Truck Cranes: 10 through 80 tons

P&H equipment is also manufactured in Australia, Brazil, Canada, Germany and Japan.

NACO ALLOY BALLS

*through closer
metallurgical control*



1½

1¼

¾

⅝

Distance from surface—inches

ROCKWELL
—63
—61
—59
—57
—55
—53
—51
—49
—47
—45

BRINELL
710
670
638
601
555
534
495
477
444
429

tumble per-ton grinding



costs

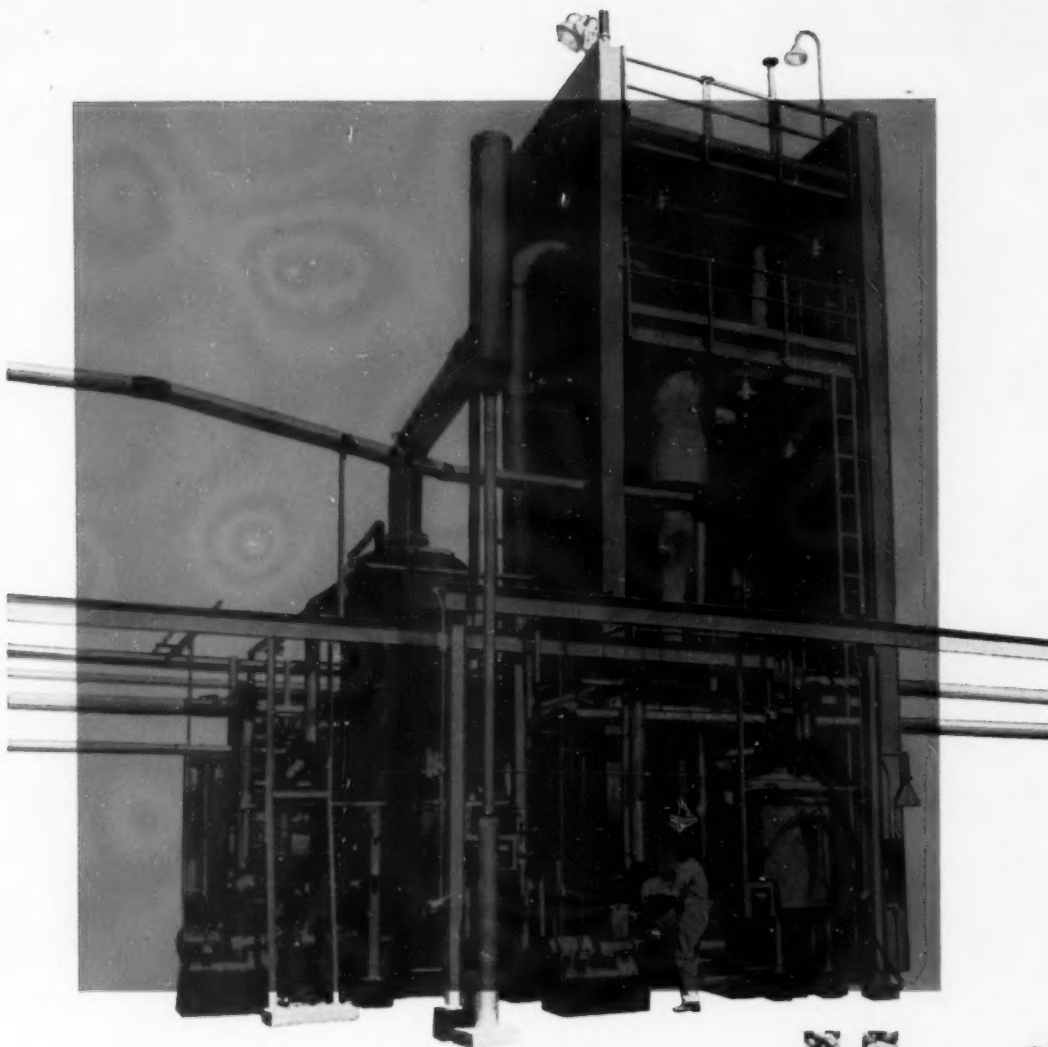
Through precise laboratory controls of the elements in steel making — from spectrographic analysis through final heat treating — Naco Grinding Balls possess the correct structure and hardness for maximum impact absorption and wearing qualities. Structurally, Naco Grinding Balls have a grain akin to tool steel — tough, hard and rugged. Laboratory tests show remarkable uniformity in solidity and controlled hardness holding to desired depth. Every day more mill operators are tumbling to the cost-saving advantages of Naco Grinding Balls.

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NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

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Now Ammonium Nitrate in

pellets

**New \$5,000,000 Atlas Plant
Produces Unique, Improved Blasting Agent**

Atlas is now producing low cost Ammonium Nitrate in a new pelleted form designed especially for blasting. Atlas Pellets give oil absorption equal to prills, and flow freely for fast loading into all types of blast holes. The new blasting agent is being made in the new \$5 million Atlas acid and ammonium nitrate plant near Joplin, Mo.

Not a granule, not a prill, Atlas Pellets are porous but compact particles which, when oiled, have both the density and sensitivity required for efficient low cost ammonium nitrate blasting. They are the latest advance in developing new products and techniques

to help the user of explosives gain lowest possible blasting costs. Your Atlas representative can help you put these products and techniques to profitable use in your operation.

EXPLOSIVES
DIVISION
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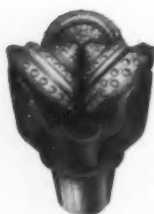
HUGHES "Rota-Blast" Bits are engineered for mining

This is the Hughes "Rota-Blast" RG-2JS rock bit . . . proved superior in the Mesabi Iron Range, toughest of all blast-hole drilling. The RG-2JS rock bit is a direct result of Hughes Tool Company research in co-operation with drill manufacturers and mine operators.

In the extremely hard, abrasive taconite in the Mesabi Iron Range, steel tooth bits drilled from 5 to 20 feet. The RG-2JS "ROTA-BLAST" consistently makes 500 to 800 feet of hole per bit in the same type of rock.

Research that developed the RG-2JS is going into the complete line of "ROTA-BLAST" bits, engineered specifically for rotary blast-hole drilling. The "ROTA-BLAST" line includes a full range of sizes and types.

Your Hughes Representative can recommend the bit that will deliver the best performance in drilling every type of rock. And behind his recommendation and behind every Hughes bit is more than a half-century of rock bit experience plus the world's largest rock bit research laboratory and manufacturing plant.



RG-2JS
For extremely hard
abrasive rock
(Taconite, quartzite)



W7R
For hard rock
(Siliceous limestone,
dolomite, sandstone,
granite)



OW
For medium rock
(Limestone, sandstone,
sandy shales)



OSC-1G
For soft formations
(Calcite, shale, clay)

Hughes "ROTA-BLAST" RG-2JS Mining Bit—Instead of conventional teeth, this bit has sintered tungsten carbide inserts combined in a special process with alloy steel cones. They provide maximum resistance to wear in the hardest and most abrasive formations. Inserts in the gage surfaces of the cones reduce gage wear and increase the cutting efficiency of the bit. Inserts on the bit legs eliminate the problem of body wear.

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Modernize your equipment fleet with today's most efficient machines

You can be sure that the years ahead will bring big demands for your products. Operating costs, however, will also rise. To safeguard your investments and to reduce costs, we suggest you look over the complete line of LeTourneau-Westinghouse hauling, grading, and earthmoving equipment. These modern machines are designed, built, and proven under all possible conditions with just one thought in mind—dependable performance that results in greater production and lower costs *for you!*

With LW equipment, you get important advantages found on no other competitive machines. On the Haulpak truck, for example, you get exclusive Hydrair, the

air-hydraulic suspension system that eliminates costly spring maintenance and repair. And on Tournapull scrapers, you get exclusive electric controls—fast-acting, easiest of all control systems to maintain. LW "electrics" also make it possible for you to move two loads *every trip*, with LW Tandems.

These are only a *few* of the extra advantages you get from LW.

Study this line of LW job-tested equipment. Then let us send you complete specifications on those units which best fit your work requirements. Our world-wide LeTourneau-Westinghouse Distributor organization is available to serve you anywhere, anytime.

Remove overburden faster, maintain haul roads and pits at lower cost, complete hauling cycles in less time with these LW machines



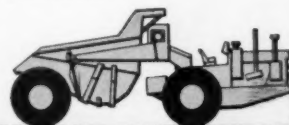
LW Tournatractor

218-hp tractor on rubber drives over highways or cross-country at speeds to 27.6 kph (17.2 mph); backs up at 11.5 kph (7.2 mph); accomplishes *twice* as much as crawlers on 85% of your maintenance and clean-up jobs.



LW Tournapulls

Self-powered rubber-tired scrapers with 21.4-m, 15.3-m, and 6.8-m (28, 20, and 9-yd) heaped capacities; 360, 270, 143-hp diesel engines; speeds up to 48.6 kph (30.2 mph). Tournapull prime-mover can also pull and operate two scrapers at a time, for double capacity per cycle.



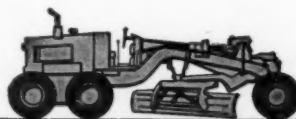
LW Rear Dumps

These heavy-duty off-road Tournapull haulers are available in 10, 20, and 31½ metric-ton sizes. These machines turn around in a space shorter than their own length (in ¼ of length when bowl is raised). A triple-layered all-steel body withstands the heaviest loading shocks.



LW Speedpull

Six-wheel scraper for top-performance on long-haul assignments. Speedpull has 276 hp, 15.3-m (20-yd) heaped capacity, 60.6-kph (37.7-mph) speeds . . . best power-to-weight ratio, Hydrair suspension and many other LW advantages.



LW Motor Graders

80, 115, 123, and 160-hp LW motor graders have 8 forward speeds, 4 reverse speeds, and 3 optional creepers; 145 and 190-hp POWER-Flow models are equipped with torque converter. 67-hp model also available.



LW Haulpak Trucks

This fully-proven LW truck is built specifically for rugged, high-speed, off-highway hauling. Its many advantages—including deep "V" body, Hydrair suspension, power-transfer differential—give you highest output at lowest cost. 20, 24.5 and 29.5 metric-ton sizes (22, 27, and 32.5 ton), up to 375 hp.

Other LW Equipment includes: Tournapull Bottom-Dumps and Cranes, Sheep's Foot Rollers, Dozer Blades, PCU'S, Towed Scrapers, Wire Rope.

Hydrair—Trademark Haulpak, POWER-Flow, Tournapull, Speedpull—Trademark Reg. U.S. Pat. Off.

LA-2284-M-1m



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DIRECT READING MAGNETOMETER THAT IS PORTABLE AND FAST

The Varian M-49 provides a maximum of magnetic data in a minimum of field time

The data is read off as an absolute value without further computation

The Varian M-49 is a 16-pound instrument easily carried over a man's shoulder. Every six seconds it gives an absolute reading of earth's magnetic field at the spot where he stands. No leveling or special orientation is needed. The reading is in gammas, accurate to plus or minus 10. Over the instrument's entire range from 19,000 to 101,000 gammas, the reading is absolute and requires no reference back to any standard. The instrument is drift free within its sensitivity specifications.

The Varian M-49 reveals variations in earth's magnetic field associated with faults and other subsurface structures, magnetic ore bodies, and magnetic phenomena coexistent with nonmagnetic ores. Exploration parties may now acquire magnetic data with great ease. It takes negligible extra time beyond that required for their other observations. Correlating these magnetic data with other measurements and observations can reveal interrelations that will greatly assist the geophysical interpretation.

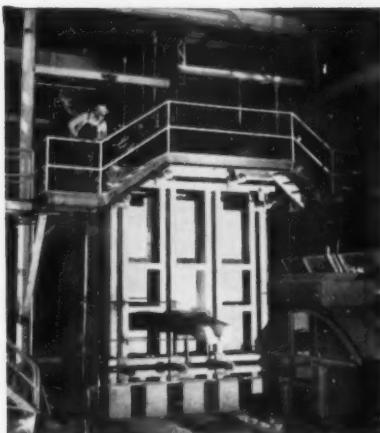
To achieve the unusual features of the M-49 Magnetometer, Varian uses the revolutionary proton free-precession principle which relies on an **unchanging nuclear constant** (of the hydrogen atom). Over one year of field use of the Varian M-49 has proven practical applicability of the instrument. Varian has built sensitive, light-weight magnetometers on this principle to go aloft in America's satellite program. Varian Magnetometers are also used extensively in aerial magnetic surveys covering tens of thousands of miles of the earth's surface.

Write today for a full explanation of the Varian Magnetometer's principles, applications and equipment features and details. Address the Instrument Division.

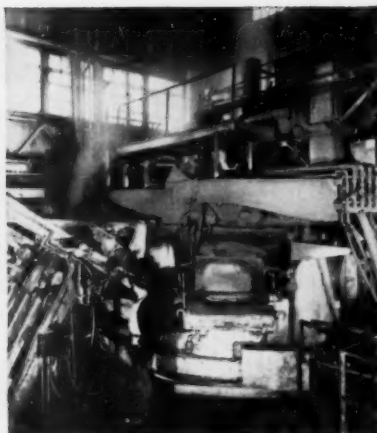


VARIAN associates
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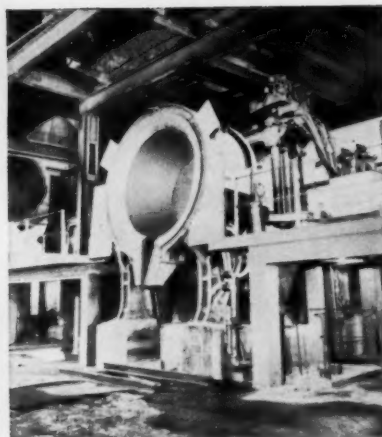
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Matte and Speiss Smelting



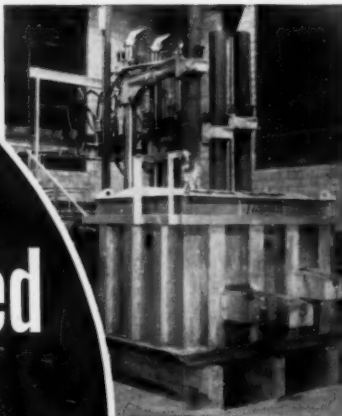
Copper Melting



On Low Carbon Ferro-Alloys

Lectromelt[®] Furnaces...used the world over

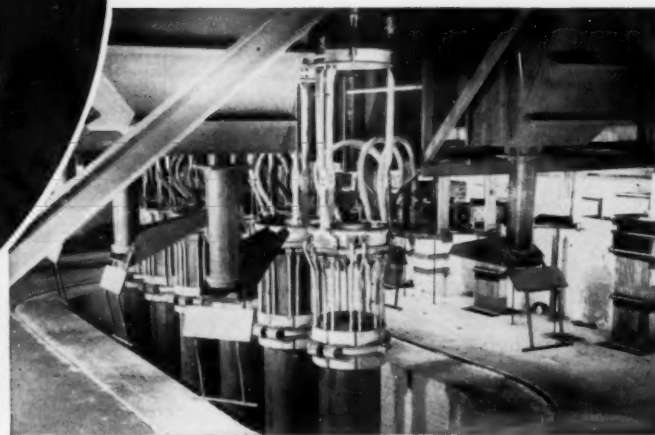
● Bulletin 959 describes furnaces for Smelting and Refining. For a copy, write Lectromelt Furnace Division, McGraw-Edison Company, 312 32nd Street, Pittsburgh 30, Pennsylvania.



Pilot Plant Research



Ferro-Alloy Smelting



"Six-in-line" Smelter



LECTROMELT FURNACE DIVISION

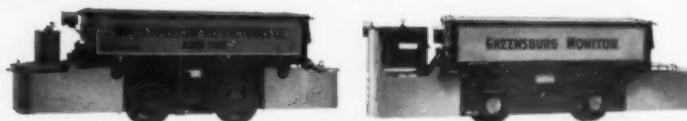
McGRAW-EDISON COMPANY

Pittsburgh 30, Pennsylvania

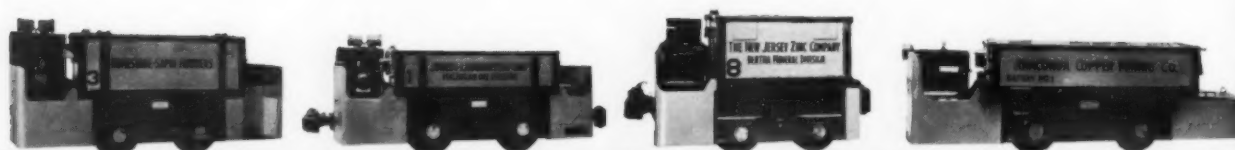
**National Mine
Service Company**



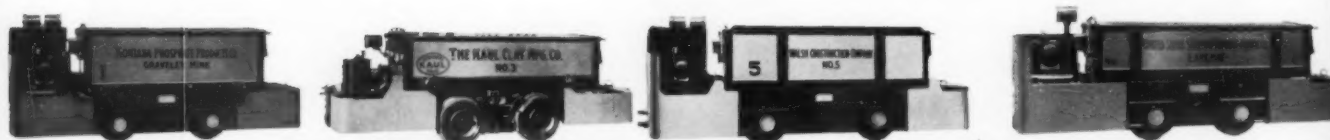
**GREENSBURG
MINE
LOCOMOTIVES**



**SERVING THE MINING INDUSTRY EVERYWHERE—
THE GREENSBURG DIVISION**

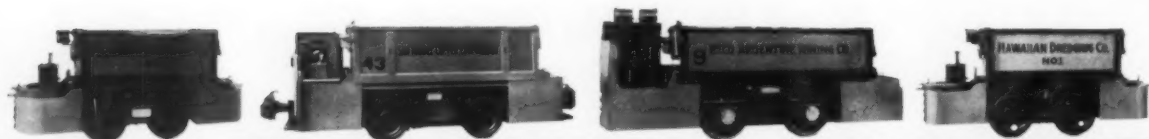


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National Mine in every major mining area. When you want more pulling power per ton, with longer battery life and higher efficiency for every invested dollar, check the facts with National Mine!

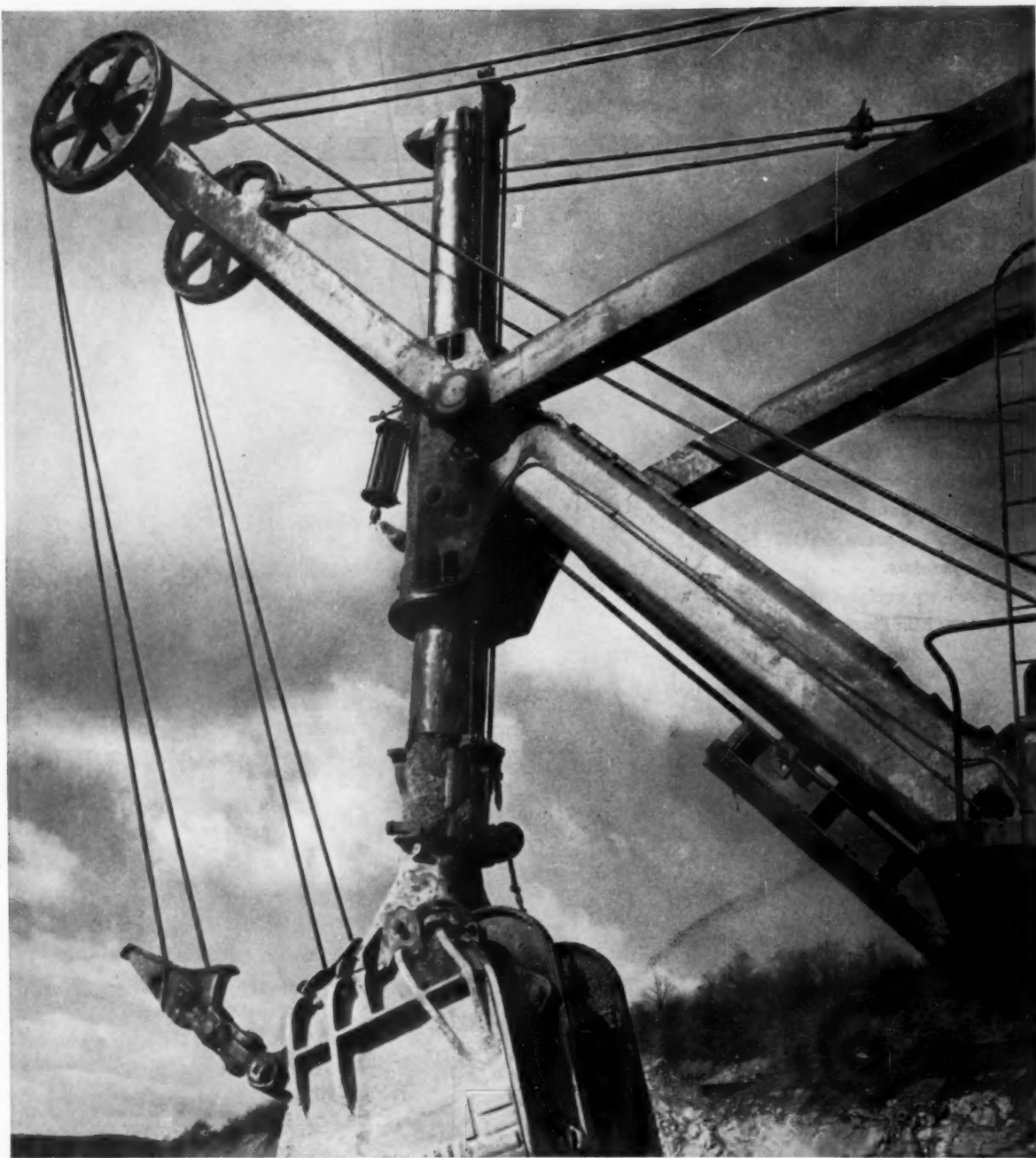


National Mine Service Company

KOPPERS BUILDING, PITTSBURGH 19, PA.

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This rope has it—and has it at every critical point of wear for these reasons:

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CATALOG, SURVEY & DIRECTORY NUMBER, 1960

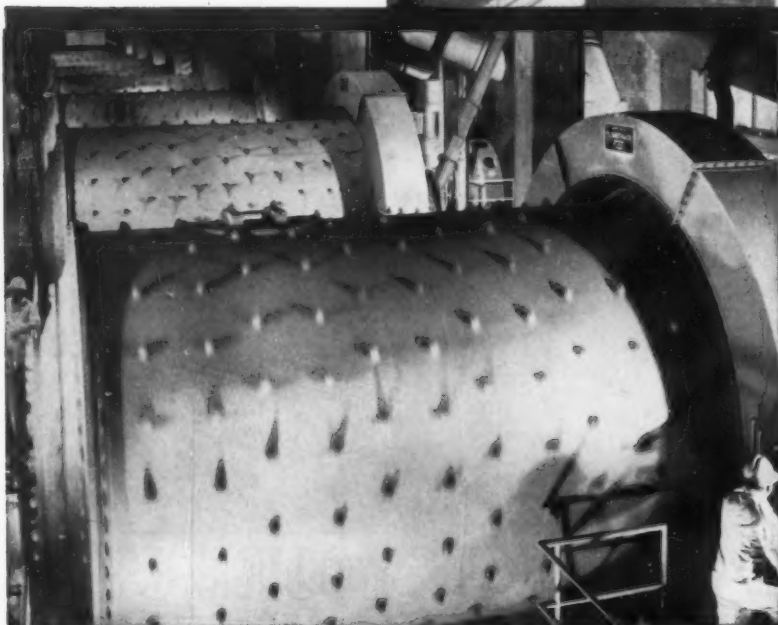
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For sintering, nodulizing, calcining, desulphurizing, oxidizing and reducing roasting. Coolers, precoolers, preheaters, recuperators.

Auxiliary equipment for Rotary Kiln Plants.



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TECHNOLOGY ADVANCES

in the mineral industry



Mineral Dressing by Adam L. Wesner

Significant advances were made during 1960 in mineral dressing by more effective application of the long used and well established concentrating methods, by utilizing physical properties not used before, and by extending the use of ion exchange techniques. Flotation research centers on oxides, slimes, and beryl.

► 40



Mining Grows More Scientific by Richard M. Stewart

Mining is in the midst of a major technical revolution as electronic data processing, management training, and scientific management are adopted by more and more companies. In all parts of world miners mechanized to raise more rapidly and to sink more swiftly. Two new electric trucks were built for open pit mines.

► 44



Exploration by Integrated Surveys by Robert B. Hoy

Missouri continued to be the most active exploration area in the United States. The mining industry's crying need is for practical methods which will eliminate the unproductive drill hole. The challenge is to locate the first hole in ore and develop an ore body with minimum possible footage.

► 57



European Ore Dressing by Pierre Gy

Research, cascade grinding, new dry concentrator, new flotation and filtering equipment, changes in grinding and classification circuits, and flotation of Swedish hematite were the most important metallurgical developments in Europe. Application to ore dressing of a fundamental law of electricity drew much interest.

► 66

Iron Ore Beneficiation

Both research and progress were made on four major beneficiation fronts. Gravity methods continue to be most widely used. Direct reduction was proved commercial at a Mexican plant. Flotation is expanding to new Canadian mills. Magnetizing roasting will come to western end of the Mesabi. Range to treat semi-taconite.

► 62

Ore Dressing Makes Significant Advances—

By more effective applications of older methods . . .

By utilizing physical properties not used before . . .

By extending the use of ion exchange technique . . .

By Adam L. Wesner

A major technological breakthrough in research to find a new and practical method for upgrading rock salt was announced by International Salt Company. Announcement of the new method for improving the quality and appearance of rock salt was made as the United States Patent Office issued Patent 2,907,456 to R. J. Brison of Battelle Memorial Institute. The new method consists of two main steps. Crude rock salt is exposed to radiant heat, the salt crystals remain relatively cool because they transmit the radiant heat waves; the impure pieces are selectively heated. After passing under radiant heat, the crude rock salt is deposited on a highspeed conveyor belt which is coated with a heat-sensitive resin. The pure salt crystals fly off the belt at the end pulley while the impurities, because they are warm, adhere to the belt longer and drop in a separate bin. International Salt Company, to whom the patent has been assigned, is using the process in commercial production in its mine at Detroit, Michigan. They plan to license the process for materials other than salt.

Herbert A. Pohl and Charles E. Plymate, Princeton University Plastics Laboratory, devised the Isomotive Cell, a new particle separator using dielectric polarization. The cell operates in a small tank of dielectric liquid; the operation consists of passing the finely divided material through a pair of diverging electrodes while the particles fall down a tilted tray. The ability of the isomotive cell to produce separations in materials of closely similar dielectric constant was demonstrated on the system Al_2O_3 - CaF_2 having dielectric constants of 8.5 and 6.9, respectively. In a further test, diamond wheel cuttings containing 99 percent alumina and 0.2 percent industrial diamond was enriched in diamond content 25 fold by a single passage through the cell. The process

appears to offer good possibilities for commercial application.

The Smith separator for sorting asbestos fiber from crushed rock is an inclined perforated conveyor belt operating at a fairly steep angle and over drums at rather short centers. Instead of idlers, the belt is supported on rotating beaters. The action of the beaters on the perforated belt results in a screening action. The principle of the method of separation is to provide a very thin layer of ore delivered by a controlled feeder and dropped a reasonable distance onto the belt. Fiber, unable to slide off the upwards moving belt, is delivered over the top, fines pass through the perforated belt and are delivered below. Twenty-five to 30 tons of ore per hour can be treated with only three horsepower and without the use of aspiration equipment.

Transarizona Resources, Incorporated, expects to have the first commercial plant in North America using the segregation process in operation in 1960. The segregation process consists of heating oxidized, or mixed, oxide-sulfide copper ore to 500 to 800°C. in the presence of a halide salt and a solid reducing agent such as coal or coke. After several reactions, metallic copper precipitates on the surface of the carbon particles. The furnace calcines are then cooled and the copper is recovered by flotation. The process and Arizona operation were outlined in December 1959, MINING WORLD, Page 19.

John L. Mero of the University of California (Berkeley, California) reported on the economics of mining and processing deep-sea manganese nodules. Estimates of tonnages run into hundreds of billions of tons. Average grade is 20 percent Mn, 15 percent Fe, and 0.5 percent each of Ni, Co, and Cu. Mining methods discussed are deep-sea drag dredging and deep-sea hydraulic dredging (the latter method is calculated as costing \$3 to \$5 per ton). Preliminary tests using hydrometallurgical extraction methods indicate that any methods developed for winning Mn from low-grade domestic ores should be suitable, from a technical standpoint, for the recovery of manganese

from the nodules.

Kennecott Copper Corporation is proceeding with the pilot-plant stage in the development of the bacteria leach process for recovery of copper from tailings of low-grade mine waste material. The bacteria use the sulphur in the mine waste as food and convert it to sulfuric acid which aids in the leaching process. They also oxidize the ferrous iron in the mine water to ferric iron, which, when combined with the acid, dissolves the sulfide minerals. A dump of 168,000 tons of fresh mine waste, located in Bingham Canyon, Utah, is being used in the development work.

A three-year program of work on a new ion exchange method of recovering gold from cyanide liquors is being supported by the National Research Development Corporation at Tiddington, England. The advantages of the process are: (1) It can be used for pregnant liquors containing relatively large amounts of metals such as copper or nickel which make zinc precipitation difficult, (2) It gives a gold product of higher purity than that precipitated with zinc, (3) It makes possible recovery of other metals such as nickel, cobalt, or even copper, (4) Combined with a resin-in-pulp technique the normal solids-liquid separation would be eliminated, and (5) It gives a potentially higher recovery of gold.

During 1959, the search for better and cheaper ways to break ore particles followed many diverse avenues.

The "electrohydraulic effect", discovered by Lev Yutkin of the Leningrad Polytechnic Institute, may have application in crushing and grinding, as well as in drilling blast holes in hard ones. For example, a huge piece of granite can easily be smashed into very small fragments. A hole is drilled in the granite and is filled with water. An electrical discharger is inserted in the water and the current is turned on. When the liquid surrounding the electric spark is accelerated, the liquid molecules fly off in all directions to create a hydraulic impact. This impact, in conjunction with a cavitation effect which follows, creates an immense force which disintegrates the granite.

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Details have been published about the leach-precipitation-flotation process (LPF) at Kennecott Copper Corporation's concentrator at Hayden, Arizona. Although the LPF process is not new, the commercial application has been limited because of the difficulty of transporting the iron, which precipitates the copper, through the flotation circuit. Kennecott uses an excess of finely divided sponge iron and removes the excess after flotation. The incorporation of IPF has resulted in the recovery of nonsulphide copper amounting to 2.0 pounds per ton of ore, or an increase in recovery of 10 percent. The sponge iron, and the sulphuric acid, are pro-

duced from pyrite extracted from the tailing of the sulphide section of the Hayden concentrator.

Interest in pyrochlore concentration continued with further indication of the major progress made in the past few years. Columbian Mining Products (Coulee-Headway) reported continued improvement in results by a method in which the key step is flotation with a combination of long-chain amines, diamines and wetting agents. Indications are that it is now practical to produce a concentrate of at least 20 percent Cb_2O_5 from ores containing only 0.3 percent Cb_2O_5 . Kennecott Copper Corporation obtained British and United States

patents on flotation of pyrochlore and other columbium-bearing minerals employing one of the hydroxyquinoline chemicals as a collector. Consolidated Mining & Smelting Company of Canada Ltd., has developed a flotation procedure for the pyrochlore ore from Beauce Mines in North Bay, Ontario. St. Lawrence River Mines hopes to become Canada's first columbium producer with a new physical separation process; a pilot plant will be built in Montreal to treat open-pit ore. Although some problems remain, the rapid progress in this field is an interesting illustration of what can be accomplished by intensive experimental work.

Crush tomorrow by hydraulic impact, electric shock waves?

Kurt Schmidlapp related why Germans crush potash by impact. Drawing on his experience at the Neuhofer mill of Wintershall A.G., and at other potash mills. In the Hazemag type of impactor crude salt is split along its natural cleavage lines as it strikes the gravity hung impact plates with great force. His tests indicated that dry impact crushing followed by wet rod milling, with oversize returned to impact disc mills, was the most profitable method of crushing and grinding before flotation. In practice, doubling the milling capacity was possible without major equipment additions. Mr. Schmidlapp's two part description appeared in the February, page 48, and March, page 40, issues of MINING WORLD.

In anticipation of expanded output, Rhokana Corporation, Ltd. switched from 8-foot-diameter ball mills to 12-foot-diameter rod mills in its Mindola concentrator at Nkana, Northern Rhodesia. Dr. J. P. Kearney, concentrator superintendent, reports the change was made without a let-up in production. The ball mills were replaced by rod mills, which made it possible to eliminate the tertiary crushers and screens from the circuit. Roller bearings on the rod mills, replacing white-metal bearings on the ball mills, made it possible to drive the large mills with the same motors used for the small mills. The mechanical classifiers were replaced with wet cyclones.

Autogenous mills were selected for wet grinding of specular hematite ore in the concentrator of Quebec Cartier Mining Company which is under construction on the shores of Lake Jeannine in Quebec, Canada. The choice of autogenous mills was based on pilot-scale tests conducted

by the Hardinge Company at York, Pennsylvania. The concentrator will have a capacity of 60,000 tons of ore per day. The ore, which assays 30 percent iron, will be ground to minus-10-mesh and will be treated in Humphreys spirals to produce a concentrate containing 66 percent iron.

A changeover from steel-ball grinding medium to large pebbles of ore was made at Milliken Lake, Algoma Nordic, and Algoma Quirke mines in the Elliot Lake district in Ontario. The change eliminated abraded iron in the amount of 2.5 pounds per ton of ore and thus reduced the consumption of sulphuric acid and sodium chlorate.

Operational studies on mill linings at the Otanmäki Company's concentrator in Finland were described by Urmas Runolinna. A 12- by 9-foot rod mill discharges to rake classifier operating in closed circuit with a similar size ball mill. The mill shells, divided into three sections, are lined with rubber on which are set longitudinal ribs of alloy iron or steel wedged into place by wooden (birch) ribs. The ribs expand when wet and lock the assembly into position. The discharge end of the ball mill is lined with thin manganese steel plates. Among the advantages of such composite linings are: (1) Reduction in weight and cost due to the lower density and lower cost of the timber, (2) Long life of the lining, i.e., about six years—because the balls became partially imbedded in the wood and thus minimize wear of the ribbing, (3) Relatively uniform capacity throughout the life of the lining and higher capacity than that obtained with new liners, and (4) Reduced maintenance costs.

H. E. Rose and M. D. Trbojevic reported on observations made through a transparent cover of a small-scale model mill operating at 150 percent of the critical speed. The charge was found to oscillate in the mill shell in a pendulum-like manner. The leading edge ascended to an altitude of about 45° above the horizontal and then collapsed and fell as a coherent mass upon the lower portion of the charge, thus giving rise to a heavy blow.

Research investigators at Allis-Chalmers Manufacturing Company are investigating brittle fracture and high velocity shock waves. They have designed a laboratory model of a crushing machine that conditions particles to break in tension rather than by compression as conventional crushers now do. Electrical discharge systems to generate shock waves are also under study.

R. F. Pilgrim of the Department of Mines, Ottawa, Canada, prepared a review and evaluation of methods of particle size analysis. Included are discussions of methods of measuring shape factors and of factors relating the size of particles measured by different methods, a classification of sizing methods, and a treatise on sieve analysis. Sieving is shown to be a statistical process, the probability of a particle passing through a sieve depending on several factors. The advantages are shown of using wet sieving and a rate-defined end point.

D. Bradley and D. J. Pulling discussed flow patterns in the hydraulic cyclone and their interpretation in terms of performance. Dye injections into the fluid flowing in cyclones gave results which compared favorably with performance data for a particular design of cyclone.

Flotation Research Centers on Oxides, Slimes, and Beryl—

This review consists of two parts: (1) Techniques developed for flotation of specific minerals in laboratory of pilot-plant scale experimentation, and (2) Flotation plant operations. There has been no attempt to include the large amount of work reported on the theoretical and fundamental aspects of flotation.

Sulphides: P. R. Hines found that diphenyl guanidine gives a better recovery of the sphalerite and marmatite in the Bunker Hill ore, and a higher grade of concentrate, than potassium ethyl xanthate. The diphenyl and dibutyl derivatives of both urea and guanidine are excellent flotation collectors.

Toru Ishihara and Yasumichi Kagami discussed flotation of pyrrhotite using a cationic collector. By using Rosin Amine D Acetate (RADA) as collector, magnetic separation can be eliminated from the pyrrhotite dressing flowsheet. In flotation of Kamaishi pyrrhotite which gave a recovery of only 17 percent with 200 grams of ethyl xanthate per ton of ore, a recovery of over 86 percent was obtained by adding a second flotation step with 40 grams of RADA per ton of ore.

A slime flotation process reported by D. W. Frommer and M. M. Fine of the U. S. Bureau of Mines may augment existing domestic reserves of lead. The work was done on lead sulfide slime tailings which were about 70 percent finer than 400 mesh and assayed 0.20 percent lead. By using larger than normal amounts of sodium sulfide and xanthates, up to 45 percent of the lead was recovered in a flotation concentrate which assayed up to 6.5 percent lead.

Nonsulphides: W. C. Aitkenhead and J. A. Jaekel reported on work conducted at the Mining Experiment Station of the State College of Washington. Pilot-plant tests on the amine flotation of oxidized zinc ores indicated that ore from the surface workings of Pend Oreille Mines and Metal Company is amenable to the process. They found that an emulsion of stearic acid, kerosene, and soap was an excellent collector for autunite. Mr. Jaekel also reported on the results of experimental work on flotation of chrysocolla in July 1959, *MINING WORLD*, page 44. The chrysocolla was activated with sodium sulfide and floated with a combination of American Cyanamid 404 or 425,

Aerofloat 31, pine oil, and sulfuric acid. The method is said to be easy to control, and it might be expected to yield satisfactory recovery of other oxides and sulfides in a mixed copper ore.

Y. Yokojama and M. Mamiya investigated the flotability of quartz in the presence of copper ion by tests conducted with different pH values, and with varying amounts of copper sulfate and sodium oleate. The conclusions were: (1) Maximum flotability is found at the molecular ratio of copper to sodium oleate of 1:1; an excess of sodium oleate tends to depress quartz; (2) The optimum pH range for copper activation is from 6.0 to 10.5; and (3) Copper in the form of cuprous hydroxide can be adsorbed on quartz surfaces and thus act as the link between the quartz surface and the hydrophobic film of copper oleate.

A newly formed beryllium mining and milling company, Dynamic Metals Corporation, reportedly has exclusive rights to a reagent for flotation of beryl which could make it possible to recover much more finely disseminated beryl than is recoverable

Gravity separation studies made on sizes down to 325-mesh

A method of deriving a significant and reproducible relative separation index for heavy-media concentration was proposed by Wolfgang Hentzchel. Helmut Kirchberg calls the deciding criterion for a concentration process the separating power. He discusses the characteristics of heavy pulps and their effect on separating power. He also describes new, simple methods for the measurement of the most important characteristics, that is, pulp consistency and instability. Investigations on heavy pulps showed that particle size distribution and particle shape greatly influence the properties of the pulp, and hence the

separating power.

Gustav Tarjan discussed the tangential, radial, and axial velocities of the medium in a hydroclone as applied to heavy-medium separation and made an analysis of the behavior of particles of different grain size, of the pressure drop, and of the influence of cone angle and feed nozzle diameter. The behavior of heavy media, the influence of its specific gravity and viscosity, and the particle size distribution within the cone were studied. With a heavy medium of high specific gravity and high viscosity comparatively large particles tend to be under equilibrium conditions at

the walls of the cones, thus reducing the wear on the walls.

F. A. Williams discussed performance data of plant scale jigs in the recovery of semiheavy minerals from quartz. Data are given in terms of zircon, anatase, and topaz for the specific gravity range of 4.5 to 3.5 for grain sizes from 6 to 325 mesh. The results could be used to estimate the probable percentage recovery of other semiheavy minerals within this range of specific gravity. Some new fields for the use of jigs in ore dressing are indicated.

Several Australian rutile and zircon producers are using a locally de-

Concentrate dewatering and filtering grow in importance to

Kerosene is used as an aid in filtering copper concentrates at the Rosebery mill of Electrolytic Zinc Company of Australasia, Ltd. The addition of 0.25 pound of kerosene per ton of dry concentrate decreases the moisture content somewhat and speeds up truck loading by 40 per-

cent. Faster loading is obtained because the filter cake forms into small pellets as it falls down a steeply inclined chute, in this form the concentrate flows readily into trucks from the storage bin. The kerosene is added to the vent pipe of the pump which feeds the filter.

Sand is used to reduce the moisture content of concentrates going from mill to smelter at Kennecott Corporation's Nevada Mines Division at McGill, Nevada. A porous layer of sand is picked up first; this acts as a protective layer to prevent slimes from reaching the filter cloth and

Operators Separate Feed into Fractions for Treatment

by hand sorting.

E. A. Lowe and F. B. Brien of the University of Washington reported on the development of a very selective technique for flotation of chromite from a refractory ore containing olivine. The head ore, containing 25 percent Cr_2O_3 was ground with oleic acid, fuel oil, and sodium fluoride. Sulfuric acid was added to reduce the pH to about 5.0 for flotation. The froth concentrate, after a single cleaning, contained 93 percent of the Cr_2O_3 at a grade of 47.4 percent Cr_2O_3 and a Cr:Fe ratio of 2.32:1.0. In addition to developing a technique for an ore which had previously resisted concentration by flotation, a contribution has been made to the understanding of reagent functions in nonmetallic flotation.

A. E. Roberts of the MINING WORLD staff described the practice at American Cyanamid Company's Orange Park Mine near Lakeland, Florida in February, page 32. The plus-20-mesh material is removed by screening and classification procedures to make finished products, and the minus-20-mesh fraction is classified into three size fractions, minus-20, plus-65-mesh, minus-65, plus-105-

mesh, and minus-150-mesh slimes. The slimes are discarded; the intermediate and coarse fractions are treated in separate rougher circuits to float the phosphate with fatty acid. The combined rougher concentrates are conditioned with sulfuric acid and are washed to remove fatty acid, and final concentration is made by floating silica with Aeromine 3037. Flotation of the coarse (i.e., minus-20, plus-65-mesh) particles is unique. American Cyanamid has found that flotation gives equal or better results than other techniques and that flotation requires less capital investment, less floor space, and results in lower operating and maintenance costs.

Three changes in the treatment of Shattuck Denn Mining Company's sulphide ore of lead-zinc-gold-silver-copper have contributed most significantly to better metallurgy at the 1,000 ton per day Iron King mill near Prescott, Arizona. These include: (1) The use of stronger promoters for gold in the lead flotation circuit and more selective reagents for zinc flotation, (2) The addition of a regrind circuit to the lead flotation section, and (3) Cyanide processing of tailing from the lead regrind circuit—instead

of the final zinc flotation tailing. In addition, several mechanical changes were made including enlarged capacity for filtration of concentrates, closer control of particle size in the ball mill feed, substitution of cyclones for mechanical classifiers, and provision for centralized reagent mixing. This general overhauling resulted in higher grade of concentrate, sharp gain in recovery, and an increase in economic return. (Reported in MINING WORLD's October issue, page 24.)

International Minerals & Chemical Corporation revised the process for flotation of potash at Carlsbad, New Mexico. The coarse and fine particles are pretreated in separate circuits before flotation of the combined feed. The ore after grinding, screening, and pulping is classified into a coarse and a fine fraction. Clay is removed in both circuits, the coarse is conditioned with a petroleum oil and amine, the fine with starch to inactivate clay. After conditioning, the two streams are joined for conventional flotation. IMC Claims the K_2O content has been raised 0.6 percent, starch cost reduced by 46 percent, amine cost reduced by 10 percent, and efficiency increased by 3.6 percent.

as dry dressing methods gain importance for desert minerals

signed and patented lightweight fiberglass wet spiral separator. Developed by technicians of Hartz Trading Company, Southport, Queensland, Australia, the spiral preconcentrator is claimed to handle a higher capacity and requires less attention than the conventional spiral and results in a minimum of tailings loss. On some materials, satisfactory results have been reported on head feeds in excess of three long tons per hour.

Air tables are used to concentrate pyrrhotite at the General Chemicals Division's Gossan mines, near Galax, Virginia. Although not new, this operation represents an interesting

application of air tabling to sulfides in the minus-3, plus-48-mesh range. From a typical feed analyzing 25 percent S, a concentrate of 33.7 percent S, and a tailing of 8 percent S are produced. Each table treats from 4 to 8 tons per hour of ore depending on feed size.

Pierre Blazy states that dry ore dressing methods are gaining importance following the discovery of minerals in desert regions. He describes an apparatus where a fluidized medium is obtained by means of a pulsating air stream. The movements of a screen box cause the heavy

products to move upwards over its inclined bottom plate while the light products are discharged over the opposite end. The movement of the screen box must be synchronized with that of the slide valve for the control of the air distribution. Particles from 0.0028 to 1.2 inches (0.07 to 30 millimeters) in size can be handled successfully. Ores with a relative difference in specific gravity of less than 0.15 are difficult to treat. A moisture content of 3 percent is the extreme limit for a speed of minus-0.04-inch (1.0 millimeter), but 5 percent moisture may be tolerated for a coarser feed.

ease handling, cut freight cost, and reduce smelter fuel

choking it. The company also found that moisture could be reduced even farther by maintaining a low pulp level and by operating the drum at a lower speed. Since incorporating the changes, the concentrate moisture has been reduced 24 percent; this has eliminated air drying and allowed

direct shipment to the smelter.

Internal cloth blinding is said to be prevented by a new patented device licensed by Peterson Filter and Engineering Company. The filter medium can be continuously removed from a drum filter, washed thoroughly and then automatically replaced on

the drum. Cakes too thin for other filters can be completely discharged without blow back. The cloth discharger has been in operation for over two years at U. S. Potash Company, Carlsbad, New Mexico, for recovering potash brine from clay slimes.

(Continued on page 56)

Mining Turns To Scientific Methods;

By Richard M. Stewart

During this past year a rocket hit the Moon, numerous satellites orbited the Earth and two are orbiting the Sun. Manned rockets have set new speed and altitude records and man is preparing to go into space during the next five years. On our own planet, two men reached the bottom of the deepest trench in our oceans, and submarines have sailed under the North Pole.

What does all this mean to mining? We are in the middle of a major technological revolution. Some of these new developments may have applications to the mineral industries, particularly those dealing with the exploration of the seas.

Under-Sea Minerals

The last major frontier left on Earth lies beneath the seas. This past year has seen two developments that may interest mining industries. Nodules have been collected and analyzed from ocean bottoms since 1873. These nodules contain significant quantities of manganese, iron, nickel, cobalt, copper, and phosphorous.

Estimates indicate mineral values on the order of \$43.00 per ton for the nodules which have a mean depth between 10,000 and 15,000 feet beneath the sea. However, some deposits are relatively shallow. One concentration is located about 200 miles off the United States eastern coast. Evaluation of all the sampling that has been done in all the oceans indicates that the quantities of the non-ferrous metals are sufficient to support all of the mineral needs of the world for nearly a century.

This past year, the United States Navy bathysphere *Trieste*, with two men aboard, dived more than 37,000 feet to the bottom of the deepest known sea. Oceanographers the world around are multiplying their efforts to explore and sample the major part of the Earth's surface which lies under water. In the near future, the ocean floors will be mined. The mineral resources are there.

Management Training

Turning toward more conventional mining problems, we note that Management has been concentrating on improving its performance. Individuals have been sent to Management

Courses at such places as Harvard, University of California, Stanford, MIT, or to institutions like the American Management Association. There they have been exposed to "Principles, Skills and Tools of Management; Planning and Organizing; Reviewing and Improving Performance." Many of the courses use the "Harvard Case Study" method of teaching where actual industrial problems are presented to the individual for his action. These are then reviewed and the most desirable courses of action emphasized. Many companies are providing this type of training for their supervisors with internal training programs.

Electronic Data Processing

Electronic data processing machines are more widely used for direct costing, payrolls, warehouse inventories, time keeping, equipment performance, and operating statistics and efficiencies. More computers are being used to assist in programming, scheduling, and evaluating the mining operation.

Industrial Engineering

Industrial engineering is concerned with the design, improvement, and installation of integrated systems of men, materials, and equipment; drawing upon specialized knowledge and skill in the mathematical, physical, and social sciences together with the principles and methods of engineering analysis and design, to specify, predict, and evaluate the results to be obtained from such systems.

Overly simplified, the professional industrial engineer is responsible for providing assistance in reducing operating costs, increasing recoveries, improving quality and control, and contributing in other ways to help optimize performance.

Industrial engineering must have one common objective and that is cost reduction. However, its job is to recommend programs to improve performance and reduce costs. Management must assume the responsibility for implementation. It is usually best to have the plant manager or department head spearhead the cost reduction programs. In this way team effort without conflict of interests produces the best results.

The scope of industrial engineering is determined by the ability of management to understand the principles of industrial engineering and apply

them to the business. Since industrial engineering is a fact-searching, analyzing, measuring, simplifying, and improving function there is no part of a business that cannot benefit from its use.

An outstanding example in this field is International Minerals and Chemical Corporation. Because of the type of business (mining and chemical), and because of its management viewpoint, industrial engineering is constantly broadening its viewpoint to give consideration to the whole. Emphasis is placed on the basic principles of using scientific analysis as a means of finding improvements. To quote the president, "The industrial engineer finds himself leaning more towards teaming with others and stressing the scientific, the economic, and management side of things."

Surveying of Small Drill Holes

A drill hole survey instrument using electronic principles for continuously recording the direction and inclination of small diameter holes to depths of 10,000 feet has been developed by Union Corporation, Ltd., Johannesburg, Union of South Africa.

The electronic drill hole survey instrument provides a continuous record at the surface from which inclination and direction of the hole can be determined at any desired depths down the hole. See MINING WORLD, April 1960, for full details.

Rotary drilling techniques are being applied to horizontal as well as vertical holes. The Hugh B. Williams Manufacturing Company, in cooperation with Hughes Tool Company, has built and is testing a 40-inch tunneling machine. It is the prototype of a 12-foot machine for tunneling in hard formations. A side wall crowd force of 300,000 pounds anchors the machine to the walls and a forward thrust of 200,000 pounds is applied to the cutters. The cutter head is rotated at 7 revolutions per minute.

Rotary drilling has been applied to a 25 foot diameter borehole by Dutch State Mines. The technique utilized a drilling mud to hold back water which was present in some of the stratas which were penetrated. Through sediments a 6.5 foot pilot drill was used and in hard rock a 34 inch diameter Hughes drill was employed as the pilot. The borehole was enlarged by a series of reaming operations to its full diameter of 25 feet. It was subsequently lined to provide an inside diameter of 18 feet 4½

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Can Nuclear Blasts Prove Practical?

inches. Two shafts have been drilled to a depth of 1,700 feet by this method, at the New Beatrix Mine.

During the past year several new rotary blast hole drills were introduced and the application of this type of equipment continues to grow. For harder rock, a 9-inch down-the-hole drill weighing 450 pounds has been developed by Ingersoll-Rand Company, and it requires a tungsten carbide insert bit weighing 126 pounds.

Blasting

Significant progress continues to be made in the design and use of explosives. In order to lower blasting costs, various ammonium nitrate based compounds are being used; some from conventional suppliers and some on a do-it-yourself basis. Ammonium nitrate prills and oil (94-6) has proved to be one of the cheapest possible explosives. Under moderate ground conditions and in dry holes it appears to be an ideal solution to blasting in open pit as well as underground. Fume characteristics are in the range of dynamites with Class I ratings.

International Salt Company at the Detroit mine has been successfully placing AN prills and oil in 2½-inch by 12-foot holes with a pneumatic placer. These are detonated at the bottom of the hole with an electrically primed dynamite cartridge. They report results comparable to dynamite in both breakage and fume, but at one fourth the cost. Fuel oil is added to each 50 pound bag of uncoated AN prills and they are allowed to stand for 24 hours before using. At the face, two men load holes by first pushing the primer cartridge with a millisecond delay electric cap to the bottom of the hole with the 1-inch diameter plastic loading hose. Then a measured charge of prills and oil is blown into the hole at 30 pounds per square inch while the plastic hose is slowly withdrawn from the bottom of the hole. Five to eight pounds of AN, depending on the location of the hole, are blown into each hole. The plastic hose and the pneumatic placer are grounded to prevent the build up of static electricity which could be hazardous due to the long cap leg wires. Repeated tests have indicated no static charges under these conditions.

Greater attention is being given to the physical properties of ammonium nitrate. Gradations in particle size and the addition of fines have increased the explosive density. Organic

anti-caking agents have increased sensitivity. Porosity and coating agents have been found important factors in how well the fuel is dispersed in the explosive and how effective the resulting blast is in breaking rock.

Several compounds are being used with AN in open pit blasting; i.e. TNT, military explosives, liquid ammonia, and various metals and oxidizers. These explosives are up to four times as powerful as AN prills and oil, and offer advantages in hard rock where drill hole spacing can be increased or hole diameter decreased. The additives also increase the cost, but often there is an advantage in ground that is difficult to drill or break.

Nuclear explosions are in the future for mining applications. If the rock moving problems are big enough, nuclear explosives offer the most economical solutions. Costs of nuclear devices have been estimated at \$500,000 for a kiloton device (1,000 tons of TNT), or a cost of \$500 per ton equivalent. This is equal to the cost of commercial TNT. However, with larger explosive packages the price does not increase proportionally with the potential power. A megaton device (1,000,000 tons of TNT) has been estimated at \$1,000,000, thus a comparatively inexpensive cost of \$1.00 per ton equivalent while prilled ammonium nitrate costs \$82.00 per ton.

A great volume of rock can be excavated if the blast is not too deeply buried, and the dimensions of the crater so produced can be controlled while releasing a minimum of radiation to the atmosphere. On the other hand, if the blast is buried at depth there will be no surface phenomenon and great quantities of rock will be shattered in place and the radiation safely trapped in fused rock. This shattered material may be amenable to leaching in place.

Lightweight Metals

Aluminum is being more generally used for fabricating mining equipment where weight is a critical design feature. Aluminum and its alloys offer a desirable strength/weight ratio at reasonable cost. It also resists most types of corrosion and can be easily joined. Improved welding techniques have been an important factor contributing to its wider use.

Aluminum cages and skips have been standard equipment in many

mines. Most have been fabricated from a magnesium silicon of aluminum, the plates and sections usually being riveted and bolted together with steel rivets and bolts. The current practice is to employ these alloys and fabricate by welding with the inert metal arc welding process. This gives a stronger, less expensive structure, with better resistance to corrosion and further saving in weight. These are instances where high strength skip and chute liners are being used due to good abrasive properties of the metal. The total weight of cages and skips in steel are normally halved when fabricated in aluminum. Recent welded designs have been made weighing one third the usual steel weight.

Canadian Johns-Manville Company's Jeffrey mine has been testing an aluminum dump truck body in the open pit of Asbestos, Quebec. It is reported that the use of 7,500 pounds of aluminum plate in the new rock body achieved a net saving in the dead-weight of the unit of 7,500 pounds and allows capacity to be increased from 14.8 to 19.2 cubic yards. Thus, for every pound of aluminum used, a saving of one pound of useless load was achieved. During the preliminary tests, strain gauges were attached to areas of critical stress and a series of rocks weighing up to 6.0 tons were dropped into the body from heights ranging up to 8 feet. A 6 cubic yard shovel was used to load this vehicle in order to subject it to the severest conditions possible.

An increasing amount of aluminum pipe is being used. It ranges in size from 1 to 8 inches in diameter, and is extruded seamless with Schedule 5 or Schedule 10 walls. Schedule 5 is tested to 1,000 pound per square inch and is one-sixth the weight of standard steel pipe. Corrosion resistance under most conditions make it desirable for use underground as well as on surface. Due to its thin wall it should not be subjected to severe abrasion or blasting.

Magnesium and aluminum concrete forms are being used for lining tunnels. Sectional forms of this type are also used in shaft sinking or in locations where weight is a deciding factor.

Other applications are in rock drill parts, rail benders, belt cutting and fastening tools, tubular handles for picks and other hand tools, shovels, re-railers, first-aid stretchers, and detonator carrying cases.



TRANSLOADER set many production records for loading, tramming, and dumping ore in open stope zinc mines.

Underground

Climber speeds raising;

Alimak raising platforms which were developed in Sweden were extensively used during this past year. This raising system requires no pilot hole and utilizes a compressed air powered elevating mechanism which travels on a guide rail track installed on the hanging wall of the raise.

The guide rail is constructed from one and two meter lengths and is bolted together to form a continuous rigid track, each section of which is also bolted to the ground using rock bolts.

The platform is 5.5 feet square. Normally the miner rides underneath this platform in a cage where he is protected from any rock fall. The miner has available all necessary controls for motion of the cage and a telephone for voice communication to the level below. A manway hatch can be partially opened in the platform allowing him to observe the track above him from a safe position. Upon arriving at the face of the raise after a blast, the miner starts barring down. After removing loose rock, he ascends to the platform and stands under a protective steel bell, while continuing to bar down. When the

raise is safe, two miners set up the stoppers and start drilling a burn cut round. Normally about 25 holes, 6 feet deep are drilled for the 7 by 7 foot cross section. An experienced crew should achieve a round per shift with ideal ground conditions. Direct raising costs have been reported in the range of \$15.00 to \$20.00 per foot.

Mechanical raising methods have progressed during the past year. At Idaho Springs, Colorado, a 9 foot diameter cage raise was driven over 300 feet from the end of an 8,500 foot haulage drainage tunnel, by Contract Engineering Company. The initial vertical churn drill hole was 16 in. and 11 in. in diameter and 1,670 feet deep and served as the ventilation base and the pilot hole for the raise. A reversible positive displacement blower provided 8,000 cubic feet per minute of air at the bottom of the drill hole. The hole also accommodated a one-inch diameter, 6 by 21, conductor core hoisting rope. A 15 horsepower geared hoist was installed on surface at the top of the churn drill hole to move the cage at 60 feet per minute. The conductor core rope was used for

telephone communication between the cage and hoistman, a hoist-stop button, and conventional hoist bell system. The raise was excavated 9 feet in diameter and all drilling was done from the roof of the cage using two stoppers.

This has been the year of the "four minute mile" in shaft sinking. The world record was broken three times, once in Russia, and twice in South Africa. In April 1959, it was reported that the Russian record of 868 feet in 30 days was set in a 21½ feet diameter shaft in No. 3 shaft at New Boustoff in the Don Coal field.

During September 1959, Vaal Reefs Exploration & Mining Co., Ltd.'s No. 2 Shaft of Anglo American Corporation in South Africa set a new record of 922 feet in 30 days, although not actually trying to set a record. It was a warm-up try in preparation for breaking 1,000 feet per month. The shaft was excavated 28 feet in diameter and lined with 1 foot of concrete. During the record month, Vaal Reefs completed 940 feet of lining against 922 feet sunk.

At the start of the record month, the shaft had been sunk to a depth of

Fast haulage with Transloader; very deep

The outstanding development in underground haulage equipment is the Transloader. This self loading transporter and dumper is manufactured by Sanford-Day Iron Works Company. The vehicle is mounted on four rubber tires, and is powered by a Diesel engine. It carries 7.5 tons of ore on grades of 15 percent, and distances of 500 to 1,500 feet. The output depends on distance, but an indication of the maximum under ideal haul conditions was demonstrated to be 960

tons in one shift. This was accomplished at the Grandview mine at Metaline Falls, Washington. They have raised production per stope man-shift to 184 tons using this vehicle. It is fast, highly maneuverable, and has shown low maintenance costs. One man operates the unit through its normal cycle of load, haul, and dump.

The No. 2 shaft at Rhokana Corporation Ltd.'s Mindola mine has reached its final depth of 3,130 feet and the hoisting equipment is being

installed. The friction type hoist will be fully automatic and will be driven by two 2,100 horsepower, A.C. motors through a reduction gearbox. An A.C. winder was chosen since it is more economical to operate than a D.C. winder; also less space is required for the auxiliary equipment which will be housed at the top of the concrete head frame.

The automatic control will operate as follows: When an empty skip approaches the bottom station, the hoist

Mining Trends

sink 1,001 feet in month

1,132 feet, and the planned depth will be 7,100 feet. The consistency in their sinking progress was emphasized when Vaal Reefs broke their own record in November 1959, raising it to 954 feet per month. They have achieved a remarkable average of 751 feet per month for five months.

Anglo American Corporation's President Steyn Gold Mining Co.'s No. 3 main shaft broke the "shaft barrier" in November 1959 by establishing a new world record of 1,001 feet. The excavated diameter is 28 feet, internal 26. The planned depth is 6,300 feet. Approximately 200 holes 10 foot deep were drilled each round. The best advance per shift was 11.0 feet with an average of 9.9. The average cycle period was 6 hours 41 minutes. Best advance per day 40.0 feet with an average of 33.4.

Mr. H. MacConachie, consulting engineer to Anglo American, said at the Symposium on Shaft Sinking and Tunnelling of the Institute of Mining Engineers in London in July "Today's record is tomorrow's standard, and we in South Africa look forward to the day when a sinking footage of 1,000 feet a month will be attained

and accepted as normal." Future developments which have already been tested are 30 cubic foot cactus grab and 15-ton buckets.

A common practice by Anglo American is to drill two holes from surface on opposite sides of the shaft. These are started prior to shaft sinking and kept about 2,000 feet ahead of the shaft bottom. As soon as water is encountered, cement is pumped down the holes thus filling up the water fissures and reducing the quantity of water likely to be encountered during sinking.

Western Deep Levels Ltd. in South Africa uses an Eimco 630 for mucking in its ventilation shaft. Six-ton buckets are loaded and hoisted at the rate of 12 to 14 per hour from below the 5,000 foot level. The 630 loader is brought to surface after each mucking cycle.

Engineering has been a very important element of the plant planning. In order to reduce air resistance in this 20 foot diameter ventilation shaft, new type of steel cross members were developed. These are fabricated from pipe-like sections rather than the "I" beam sections and they have 60 per-



EIMCO 630 air powered loader was used in sinking many South African shafts. Picture at Western Deep Levels shaft.

cent less air resistance. The new sections have rounded top and bottom and flat sides. These elliptical box sections are concreted into the sides of the shaft and offer greater stiffness, lighter weight and less air resistance than normal "I" sections. The new buntons will be installed at 15 foot intervals at Western Deep Levels and at 20 foot intervals in the Vaal Reefs shaft.

A Swedish development recently announced was the Aligrab platform sinker which utilizes the guide rails of the Alimak raise climber. At Kiruna, an elliptical shaft with an area of 11 square meters has been sunk using this equipment with a cactus grab. The raise type of guides bolted to the shaft wall are used to position and support the platform and grab which is mounted on a telescopic boom. Broken rock is loaded into buckets and independently hoisted to surface. Drilling is done from a jumbo which is built so that one miner operates two machines. A standard hole pattern has been developed to break seven feet per round. The initial goal for this equipment was 1.2 feet of shaft per man shift.

Mindola shaft to hoist 10,000 daily tons

starts decelerating at a predetermined point in the shaft and finally brings the skip to a stop—within inches of the loading point. A pneumatic cylinder then pushes a loading flask containing a weighted quantity of copper ore into the shaft and over the skip. At the same time a door in the bottom of the flask opens and allows the ore to discharge into the skip. When empty, the flask is withdrawn from the shaft and the skip starts its upward

journey. While all this is taking place in the bottom of the shaft, the other skip discharges its contents in the bin at the surface. A 15-ton skip load of ore will be delivered to the surface bin every 90 seconds. Maximum rope speed will be 3,000 feet per minute. In addition to the primary purpose of hoisting 300,000 tons of ore per month, this shaft will also supply approximately 750,000 cubic feet of ventilation air per minute to the

deeper sections of the mine.

Swedish General Electric Company claims it is delivering the world's largest mine hoist to Vasteras in the Soviet Union. It will ultimately be used to hoist 50-ton capacity skips from a depth of 3,900 feet. The ASEA made skips will be hoisted automatically at a velocity of 2,500 feet per minute and will require 12,000 horsepower.

Two New Electric Trucks For Open Pits

In September 1959, a radical new truck was delivered to The Anaconda Company for use in the Berkeley pit in Butte, Montana. This 40 cubic yard capacity vehicle is powered by four electric motor wheels rated at 400 horsepower per wheel. The truck was built by R. G. LeTourneau, Inc., and will carry a 60-ton load up a 15 percent grade at 13 miles per hour. It will operate on dual trolley wires to provide the 1,600 horsepower at 600 volts DC. At the Berkeley Pit, 22 cubic yard Diesel trucks haul 35 ton loads on 7 percent grade at 6 miles per hour.

The Anaconda truck also has an auxiliary 325 horsepower Diesel-electric power plant to facilitate hostling off the trolley wires. Using the Diesel-electric power on a level haul, it will travel eleven mph loaded, or fifteen mph empty. All controls are electric: steering, dumping, and braking. This vehicle is specially designed to operate in a relatively deep pit where haulage roads with maximum grades are desirable and where they can be utilized for long periods of time.

A second vehicle of this type has been delivered to the M. A. Hanna Company at Hibbing, Minnesota. This truck was built by Unit Rig and Equipment Company, of Tulsa, Oklahoma. It utilizes General Electric motorized wheels. A 600 horsepower, V12 Diesel engine drives a generator which provides electric power for the motor wheels. The unit can operate with either two-wheel or four-wheel drive. Each wheel is rated at a maximum of 380 horsepower. This 36 cubic yard capacity truck will haul 55 tons of rock up a 6 percent grade at

8.6 miles per hour. Control power utilizes electric braking and hydraulic steering and dumping. Diesel-electric trucks are best suited to open-pit operations of great horizontal extent with moderate grades. Normally the pits would be relatively shallow and ore haulage dispersed.

Another development along these lines is a rubber tired locomotive using G.E. motorized wheels. While normal railroad pit grades are limited to 3 percent, this new locomotive would provide greater traction with low pressure rubber tires. It could haul ore cars on grades up to 10 percent. The cars could be mounted on either rubber tires or steel wheels with rails.

The Nevada Mines division of Kennecott Copper Corporation is operating its recently completed inclined skipway at the Liberty open-pit copper mine near Ruth, Nevada. Operating over the 1,380 foot long track system extending from the edge of the pit at ground level to the bottom are two 25-ton-capacity Rock-Over type skips. The skips operate on a 19° incline with a lift of 435 feet. They are capable of handling 1,000 tons of ore or waste per hour. The skip hoists on surface are automatic with safety control switches used where necessary throughout the installation. Operating in balance the skips will discharge into two bins of 100-ton level capacity each, or 180 tons surge capacity each.

A similar inclined skipway system is being planned for hoisting copper ore from Kennecott's deep Chino pit located at Santa Rita, New Mexico.

Bucket wheel excavators have been used in Europe for many years to strip waste from brown coal seams. The largest machine of this type works

near Cologne, Germany, and is capable of loading 100,000 cubic meters per day into 100-cubic meter capacity railroad cars. This tremendous machine weighs 5,600 tons and is mounted on Caterpillar tracks. The 51 foot diameter digging wheel has 10 buckets of approximately 5 cubic yard capacity each.

In January, 1959, the fourth of a series of bucket wheel excavators manufactured by Bucyrus-Erie went into service at the Cuba, Illinois, No. 9 mine of the United Electric Coal Company. Designated the Kolbe wheel, in honor of Frank F. Kolbe, president of United Electric Coal Company, this new machine has a practical digging capacity of 3,500 cubic yards per hour. The new Kolbe wheel has a maximum overall length of 420 feet and a total weight of 2,100 tons. The 27 foot diameter digging wheel carries ten 2.5 cubic yard buckets and has a speed of 8 revolutions per minute. Excavated material discharges from the ladder belt at 910 feet per minute on the stacker belt moving at 1,225 feet per minute. The 60 inch stacker belt has a 5 ply, 7/16 inch top cover including five nylon cord breakers and a 3/32 inch bottom cover, including one longitudinal breaker.

Electric shovels of larger capacity are being used for loading the giant trucks used in open pit operations. The largest is being used by Western Contracting Corporation to strip waste from the upper branches of Kennecott's Bingham pit. These Marion 191-M's with 13 cubic yard dippers are used for moving 2,000 cubic yards of waste per hour. They load a fleet of LLD 32 cubic yard, 50 ton Euclid trucks. END



NEW 1,600 HORSEPOWER R. G. LeTourneau electric truck used at Berkeley copper pit. Power is from overhead trolley wires.



NEW 600 HORSEPOWER Diesel electric truck will be used on Mesabi Range. Unit Rig truck uses motorized wheels.

1960 Blue Ribbon Equipment Awards

Mining World's annual Blue Ribbon Equipment Awards are made for new or improved equipment. Several hundred entries were received for this contest from manufacturers all over the world. The International panel of judges shown below made their selections for the most outstanding equipment contributions to the advancement of minerals industries technology.



Standing

William H. Lovo, General Manager, Hecla Mining Company, Wallace, Idaho
 Earl C. Herkenhoff, Manager Technical Services, Marcona Mining Company, San Juan, Peru
 John R. Bogert, Field Editor, Mining World
 William H. Wamsley, Mine Superintendent, U. S. Borax & Chemical Corporation, Boron, California
 Lawrence W. Wright, Chief of Geological Services, Southern Pacific Company, San Francisco, California

Seated

George O. Argall, Jr., Editor, Mining World
 E. R. Borchardt, Consulting Engineer, Borchardt and Smith, San Francisco, California
 Norman Weiss, Milling Engineer, American Smelting and Refining Company, Salt Lake City, Utah
 William T. Griswold, Manager Minerals Department, Kern County Land Co., San Francisco, California
 Stanley H. Dayton, Associate Editor, Mining World

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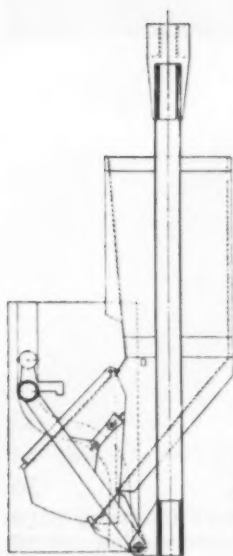
Mining World's



UNDERGROUND



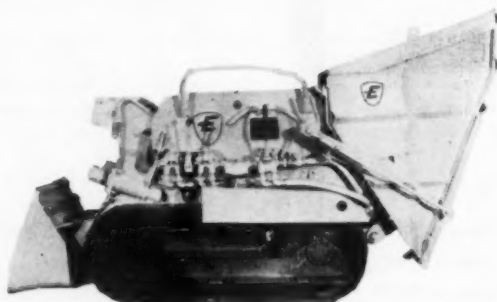
ROOF AND WALL SCALER has telescopic mast which can be extended to height of 54 feet. Scaling is done by flailing chains with peripheral speed of 1,400 feet. Landis Steel Co. Circle No. 2.



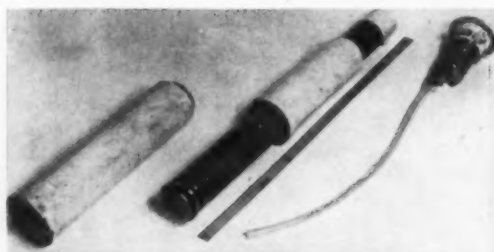
AUTOMATIC SKIP LOADING by Lake Shore, Inc. uses load cells below measuring pocket to actuate automatic loading. Skip (left) has toggle action gate. Circle No. 5.



SKOOPER, Koehring's model 205, has 7-foot level crowding action. This crawler-mounted, full-revolving, Diesel-powered front-end loading unit has 2-cubic yard bucket. Makes ideal loading machine for underground mines where low height is needed. Circle No. 6.



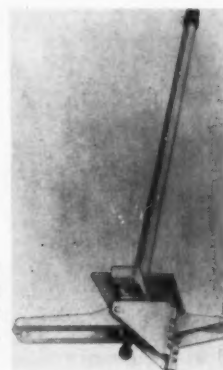
CRAWLER TRANSPORT loader carries a 50-cubic-yard payload. Gravity discharge hopper has over-center closing mechanism. Eimco Corporation makes both an air and electric powered unit. Has automatic track control and track oscillation. Circle No. 1.



POLAR PROP is quick setting yielding roof support which cannot be overloaded. The head unit which contains all the operating mechanism can be changed at, or near, the face. Made by B. R. D. Company Ltd. Circle No. 3.

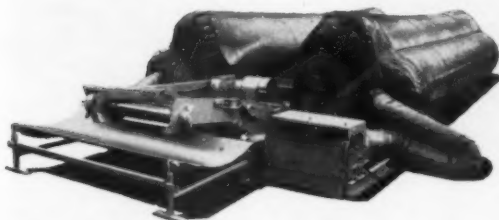


"HI-LEED" sectional drill steel uncouples easily yet retains the recognized advantages of reverse buttress design. Gardner-Denver developed this steel so that it could be uncoupled easily and fast by hand. Circle No. 4.



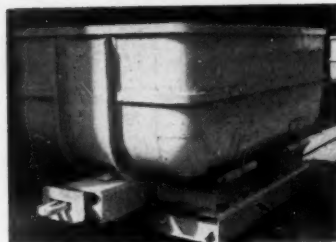
RECOVERABLE ROCK BOLT made by Dowty Mining Developments Ltd. can be removed from hole by pull on release lever. Anchorage by expansion of a bushing. Circle No. 7.

Blue Ribbon Equipment Awards

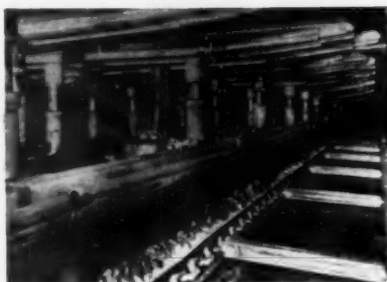


PNEUMATIC BELT FEEDER will load ore in heights as low as 18 inches. Joy Manufacturing Company built unit for potash mine. Shuttle car runs over deflated bags and dumps load. Neoprene bags are inflated to force ore onto chain conveyor. Circle No. 8.

TELLURIDE ORE CAR was built by Card Iron Works Company to handle very wet and sticky ores. The solid body car is watertight. Dumping is by external power, air cylinder or hoist. Cars can be dumped to 60° angle. Circle No. 9.



COROMANT CUT is new method of drilling in small drifts for increased footage. Template guides drilling of a center slot cut. Atlas Copco is the manufacturer. Circle No. 10.



ROOFMASTER support system is a hydraulic power-operated support system for longwall extraction of bedded minerals. Two men handle all roof supporting for 600-foot long face. A Dowty Mining Developments Ltd. product. Circle No. 11.



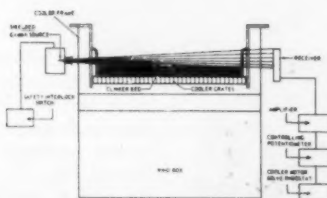
ALI-GRAB is new Swedish shaft mucking machine developed by Alimak Corporation. Machine moves in shaft on rails bolted to wall. One man controls all loading operations. Bucket capacities from 6.5 (64 tons per hour) to 32 cubic feet. Circle No. 12.



CONTROL AND LABORATORY SERVICES

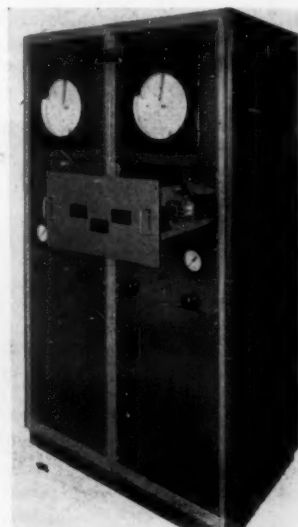


WEIGHT CODER developed by Richardson Scale Company automatically totalizes weight from a continuous stream of ore which is delivered alternately to one of two scale hoppers. Full hoppers are weighed and discharged. Circle No. 13.



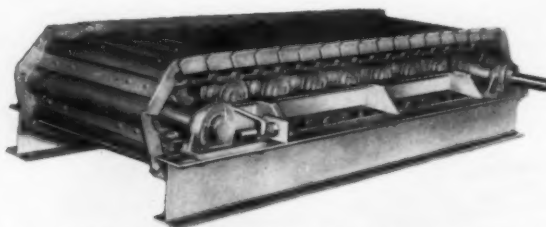
NUCLEAR BED DEPTH CONTROL for coolers has been perfected by Allis-Chalmers Mfg. Company. It automatically regulates clinker bed depth in air-quenching coolers. Circle No. 14.

PRECISION WEIGHING on conveyor belts with new Industrial Physics & Electronics unit (right) is accurate to 0.5 percent on feed of 100 tons per hour. Used at large copper and uranium mills. Circle No. 15.





ORE TREATMENT



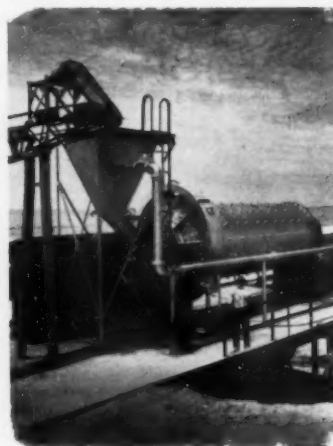
APRON FEEDER with close-tolerance forged chain eliminates take-up problems. Lengths to 300 feet and widths to 60 inches are possible. Standard tractor crawler rollers assure better ore feeding and lower head room. A National Iron Co. unit. Circle No. 16.



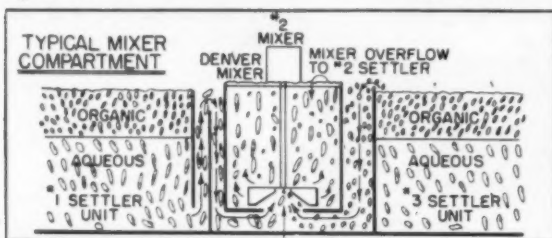
PERCUSSION CRUSHER developed by Fried. Krupp produces uniformly sized, sharp edged cubical particles with minimum of fines or oversize. High speed and long stroke give impact crushing. Circle No. 17.



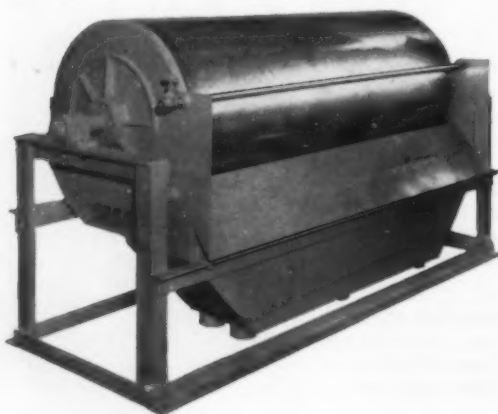
NON-BLINDING loose rod deck screen for moist sticky ores developed by Allis-Chalmers Mfg. Company. Rods are at right angles to ore flow and rotate opposite to vibrating mechanism. Circle No. 18.



MARCY SCRUBBER is a heavy duty, two-trunnion bearing supported, cylindrical unit constructed on Marcy grinding mill standards. Mine and Smelter Supply Company builds units for all types of scrubbing. Circle No. 19.



MIXER UNIT for solvent extraction eliminates need for costly acid-proof pumps and pipes. This Denver Equipment Company's vertical pumping turbine intimately mixes the aqueous and organic phases countercurrently without pumps, air lifts, or external piping. Circle No. 20.



INDOX V wet permanent magnetic drum separator (left) is a new type made by Stearns Magnetic Products. The new superior permanent magnet material, Indox V, is used in the magnet assembly. The new separator is used in HMS plants for ferrosilicon recovery as well as in magnetic iron ore concentrating plants. It provides a deeper and more uniform magnetic field, is lighter in weight, and lower in cost than earlier separators. Has been used in iron, coal, and gypsum plants. Circle No. 21.

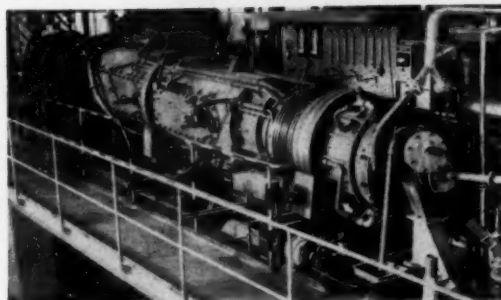


FLOTATION CIRCLE treats preconditioned reagentized feeds which are aerated as they flow across air mat. Float, water, and non-float stratify ahead of splitter. Cannon Concentrator Co. is maker. Circle No. 22.

Blue Ribbon Equipment Awards



GRATE-KILN system produces heat-hardened, self-fluxing pellets for blast furnace feed from fine iron ore concentrates. Unit offers substantial fuel economy and has been thoroughly pilot plant tested by Allis-Chalmers Mfg. Company. Circle No. 23.



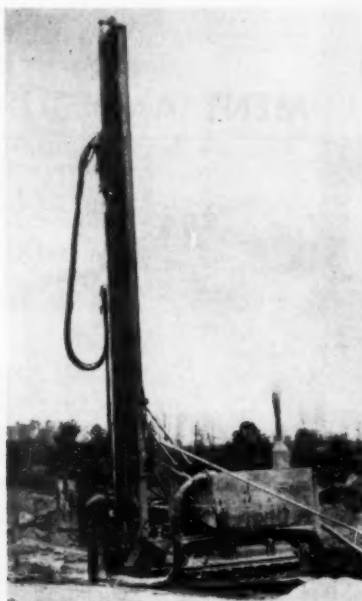
ROTARY magnetizing roasting kiln for iron ores has been tested in the experimental plant of Lurgi Gesellschaft für Chemie und Huttenwesen m. b. H., Frankfurt, West Germany. Gas-tight kiln is fired by shell burners.



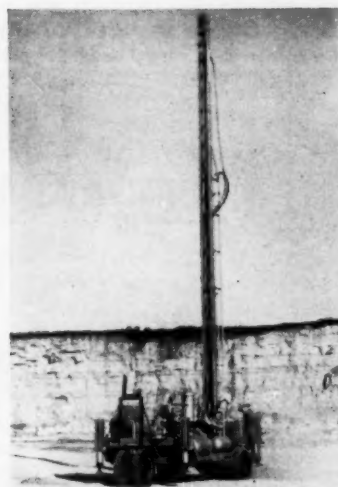
OPEN PIT



SELF-SUPPORTING drill column is easily erected as the weight of the base plate anchors the entire unit. Flottman-Werke is maker. Circle No. 25.



CRAWLMASTER blast hole drill for holes from 4.0 to 6.5 inches in diameter. This Ingersoll-Rand drill uses rotary or down-the-hole methods. Circle No. 26.



ZEPHYR BLAST HOLE DRILL is self-contained, self-propelled for one-man operation. Gardner-Denver Company built this drill complete with its own power, hydraulic, and compressed air systems. Circle No. 27.



TANDEM SCRAPER features LeTourneau-Westinghouse's exclusive electric power and control system. This made possible the first practical tandem earthmoving scrapers (left). Doubling or halving scraper capacity is done easily and quickly to fit changing pit conditions. Circle No. 28.



WIDE-ALL-CAST and wide-cast-weld dippers are designed for faster loading. The short basket fills and dumps faster. Electric Steel Foundry Company builds 5 and 6 yard sizes. Circle No. 29.

Mining World's



"LECTRA HAUL" is a 55-ton payload Diesel electric ore truck designed to cut haulage costs 10 to 30 percent. This Unit Rig & Equipment Co. truck uses General Electric motorized wheels with an integral electric motor mounted within the rim. First truck used on Mesabi Range. Circle No. 30.



DOWN-THE-HOLE hammer developed by Flottmann-Werke GmbH will drill holes as small as 2.5 inches in diameter. It is new. Circle No. 31.



MODEL FP-3 truck mounted drill has been built by George E. Failing Company for hard rock. It uses both down-the-hole and percussion tools and is equipped with chain pulldown feed mechanism. Circle No. 32.



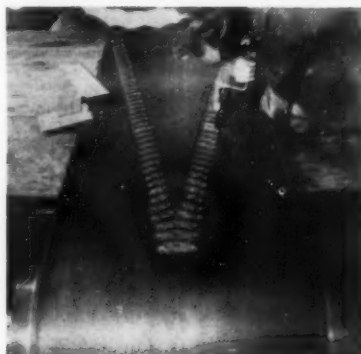
GENERAL EQUIPMENT AND SUPPLIES



TUBE RADIATOR core for cooling Diesel engines features Withnell replaceable tubes which can be removed without taking radiator apart. Made by L. M. Radiator Service. Circle No. 33.



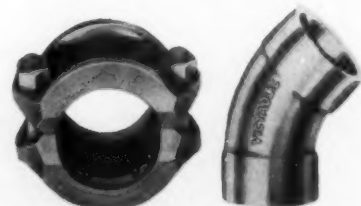
OUTDOOR SWITCHGEAR HOUSING corrosion problems have been solved by Allis-Chalmers Mfg. Co.'s aluminum unit. Panels are snapped together to form maintenance-free structure for outdoor use. Circle No. 34.



WELDLOCK SPLICE is fast, safe, and dependable high-tension mechanical fastener splice for conveyor belts. Developed by Raybestos-Manhattan. Tests prove it has same flexibility as vulcanized splice. Circle No. 35.

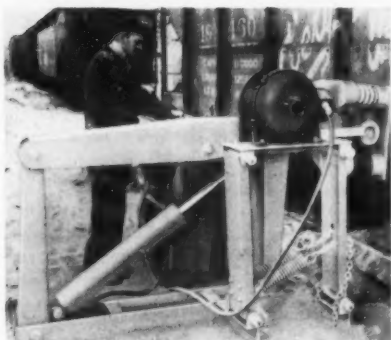


LO-BY mining rectifier furnishes a portable mine power supply. The rectifier and transformer cars are only 30 inches high. Both cars are air cooled. Only moving parts are fans. General Electric Company is the manufacturer. Operating efficiencies reach 95 per cent. Circle No. 36.



PLAINLOCK COUPLINGS make a simple, low-cost, leak-tight method of connecting plain end pipe. These Victaulic couplings assure positive grip and full flow at all joints. Circle No. 37.

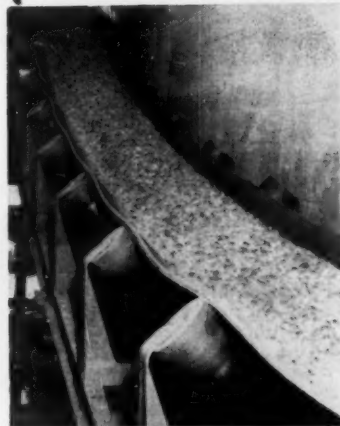
Blue Ribbon Equipment Awards



TRACKSIDE CAR SHAKER is mounted alongside car to be unloaded. The Hewitt-Robins unloader has a hydraulic cylinder which pushes vibrating head against car to loosen and shake load out of car. Circle No. 38.



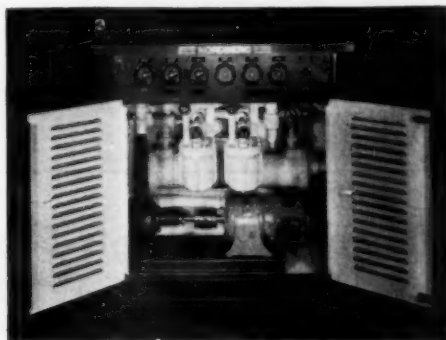
ROTAIR PORTABLE rotary screw compressor is Britain's first portable. It was developed by Holman Bros. Ltd. to deliver 600 cubic feet per minute at 100 pounds per square inch pressure. Circle No. 39.



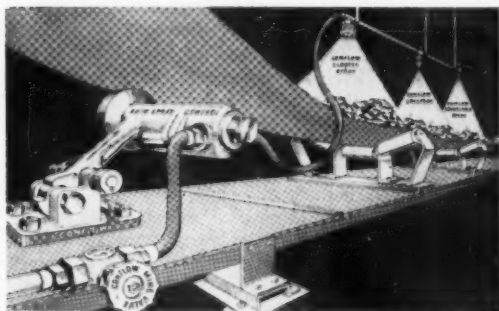
RAY-MAN heavy duty conveyor belt for 45° idlers has been developed by Raybestos-Manhattan. This belt is constructed with double compensation of internal stresses for full flexibility over 45° idlers. Circle No. 40.



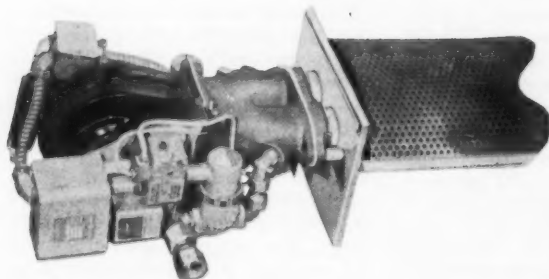
ROTARY BUCKET wheel reclaimer developed by Hewitt-Robins for stockpile reclaiming. As wheel traverses across face of pile the machine slowly advances into pile. An integral harrow pulls material uniformly from the face to reclaimer bucket. Circle No. 44.



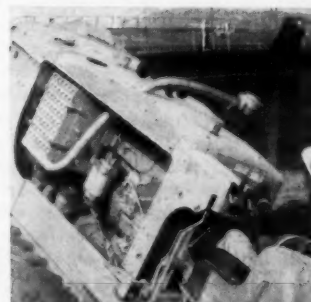
PROTECTO-LUBE system developed by Nordberg Mfg. Co. furnishes predetermined quantities of lubricating oil under controlled pressure and temperature to lubricating system on mining machinery. Circle No. 42.



CONFLOW auto spray control (left) is fully automatic for spraying liquids on materials on moving belts. Conflo Ltd. developed this unit. Circle No. 43.



INFRA RED heating unit (left) made by Lambert is used in ore car thawing in Minnesota. Rugged construction, low maintenance, and high efficiency guarantee fast thawing. Circle No. 45.



DRY AIR CLEANER by Farr is called the RotoPamic. It is two-stage with centrifugal air cleaner in series with paper filter cartridges and exhaust gas aspirator. Circle No. 44.



EXPLORATION



BERYLOMETER makes quick and positive identification of all beryllium minerals in field. Isotopes Specialties Company makes this portable unit. Circle No. 46.



PORTABLE DIAMOND DRILL, the Super Pioneer Mark 9, of Diamond Drill Contracting Company (right) has optional gear ratio for drilling to 300-foot depth. Circle No. 47.

(Continued from page 43)

Uranium Flowsheets Seek Lower Costs

The Uranium Reduction Company at Moab, Utah, has converted one of the leach circuits from acid to alkaline in order to cope with the increasing lime content of ores from the Big Indian District. High content of bentonite dictated that resin-in-pulp be used because clarified solutions for direct precipitation could not be justified. The alkaline leach requires pressure digestion in autoclaves but is nevertheless cheaper for alkaline ores. Ureco regenerates much of its soda ash; can handle ores as high as 25 percent lime with a recovery of 90 to 95 percent.

The new Federal-Gas Hills Partners' mill at Gas Hills, Wyoming, uses an acid circuit. The mill incorporates a highly efficient sand-slime separation, resulting in a pregnant slime solution of minimum specific gravity, which permits the resin to sink. The "Infilco" ion exchange circuit which treats the slime solution is comprised of two banks of gravity flow vessels, one for loading the resin, the other for eluting the resin. In each vessel solution and resin are circulated by air agitation. The resin is periodically advanced counter to the gravity flow of solution, thus it ab-

sorbs in the loading vessels and is stripped in the elution vessels to provide a continuous flow of pregnant liquor for precipitation.

Kermac Nuclear Fuel Corporation's 3,630-tons-per-day uranium mill at Ambrosia Lake, New Mexico, is operating at full capacity. This is the largest mill in the world employing solvent extraction. The ore is not dried before treatment; this saves an estimated \$0.25 per ton. Provision for handling wet ore was made in special bin construction and in designing 100 percent excess capacity into the secondary crushing plant. The sulphuric acid used for leaching is produced at the site in the world's largest contact sulphuric acid plant using molten sulphur. The organic solvent is a mixture of 95 parts kerosene, 2.5 parts General Mills tri-fatty amine, and 2.5 parts isodecanol. The barren solvent from the uranium stripping circuit passes through a secondary stripping circuit to remove molybdenum which would reduce the uranium loading capacity.

The new thorium recovery plant of Rio Tinto Dow Limited, which employs solvent extraction, is now operating at the designed capacity of 250

tons per year of thorium. Feed for the new plant is uranium tailing from the Quirke mill of Algom Uranium Mines Limited in the Blind River district of Canada. A 15 percent thorium concentrate and a metallurgical grade thorium oxide are produced. Although all of the ores in the Blind River and Bancroft areas reportedly contain thorium, this is the only plant which recovers thorium in these areas.

Mill Controls

Francis Holderreed and William Yucy of Anaconda Company described the use of X-ray analytical methods in process control at the company's concentrator in Montana. X-ray assays compared closely with wet chemical assays for copper in mill feed, concentrates, and tailings. The assays were available immediately, either continuously or at any desired interval.

An X-ray spectrograph is being used by Consolidated Mining and Smelting Company to monitor flotation tailing for zinc, at Trail, British Columbia. A gauze-covered vacuum drum picks up material continuously from the tailings line, the cake is extruded into a ribbon which passes under the X-ray beam. A pen record on the strip chart indicates the zinc content with only a 60-second lag.

Electric load controls are used to maintain optimum grinding rates in the dry grinding ball mills at the Louisville Cement Company's mill at Speed, Indiana. The ball mills operate in closed circuit with air separators; bucket elevators are used to convey the ball mill discharge to the air separators. Analysis showed that the load on the elevator motors bears a direct relationship to mill loading, and, therefore, to grinding efficiency.

A difficult control problem in many mills, that of controlling small amounts of reagents, particularly those in slurry form, can be accomplished reliably and inexpensively with Industrial Physics & Electronics Company's new time modulated reagent control system. The valve used in this system operates by application of pressure between the rubber lining and the casing. This causes the lining to collapse and shut off the flow. The valve is operated either completely open or completely closed on 10-second cycles with the percentage of time open variable from 1 to 100 percent of the time. The valve is not closed long enough to allow the slurry to settle and pack; this eliminates plugs. The system is ideally adapted to automatic process control. END

Large-Scale Integrated Surveys Now Prominent in World-Wide Exploration

By Robert B. Hoy

Exploration in 1959 continued at a surprisingly high level in view of the depressed condition of some segments of domestic mining. Companies with substantial operations in certain foreign countries, where labor costs are low and ores in many instances are high grade, found that these more than compensated for the additional transportation cost and the tariff; whereas, in the United States, the accelerating cost of labor brought more mines nearer the point of shutdown. Not all foreign developments proved fortunate. Takeover of foreign-owned production facilities is always possible as in Cuba by Prime Minister Fidel Castro. Because exploration is a long-term venture, a stable government which offers consistently fair

treatment is a *sine qua non* to attract large-scale foreign capital.

During the past year factors unfavorable to mineral consumption included the 116-day steel strike, the copper strike, and the cutback in heavy armament. United States import quotas—in force since October 1, 1958—reduced zinc imports from Canada by 50,000 tons and those from other countries to a greater or less extent, but inasmuch as United States production increased, the net result was only a minor price boost. A sword of Damocles for the mining industry is the plan for eventual disposal of nearly half of the \$8,000,000,000 national stockpile; a bill to create a Materials Reserve Agency for this purpose was defeated in Con-

gress. The domestic manganese carlot purchase program closed August 5.

Another source of concern to the mining industry has been the "Wilderness Bill." In an address to the Idaho Mining Association Earl F. Cook, director of the Idaho Bureau of Mines and Geology, struck a blow against the bill in July. Cook said the provision for mining the withdrawn areas in case of emergency by presidential authorization would be ineffectual: No one would have an incentive to explore if a presidential authorization during a national emergency were required before mining could commence. In late August the Senate Interior Committee announced it would postpone action on legislation until 1960.

Exploration in Many Parts of United States

The rate of domestic exploration was slightly higher than in 1958—evidently high performance by exploration departments compensated for personnel depletion. Kennecott Copper Corporation's exploration subsidiary Bear Creek Mining Company's announcements indicated wide activity: Payment by Kennecott of nearly \$4,000,000 for 120 claims at Safford, Arizona (said to be underlain by a plus 400,000,000-ton "porphyry" copper deposit); also in Arizona, 200 copper claims staked near Wickenburg; and 204 claims near Bowie in Cochise County. Bear Creek was reported to have developed 200,000 tons high-grade lead-zinc-silver ore below the 1050-foot level near Eureka, Utah. In Colorado, the company staked over 600 acres in the California mining district of La Plata County where platinum-bearing chalcopyrite has been found.

Other companies involved in widespread copper exploration in Arizona: American Metals Climax Corporation signed options to buy 254 claims for a reported \$3,000,000 in the Safford area, and Phelps Dodge Corporation is exploring the area. Transarizona

Resources, Inc. is developing a copper mine 28 miles south of Casa Grande with a planned daily production of 1,000 tons of 2.0 percent ore. Duval Sulphur & Potash Company drilled a porphyry copper possibility in the Mineral Park area near Kingman—located by the same "eyeballing" technique used to find Esperanza. American Smelting and Refining Company announced in July it would spend \$43,500,000 to develop an open pit mine at the Mission Project (15 miles south of Tucson) for production of 15,000 tons of ore per day; this culminated a five-year effort totaling 190,000 feet of exploratory drilling. Inspiration Consolidated Copper Company announced a \$15,800,000 program to bring the 20,000,000 ton 1.83 percent Christmas mine into production in 1962.

The Tucson area continues to rate high as a copper exploration target: Accumulated reserves now total 650,000,000 tons. Indians on the San

Carlos reservations (central Arizona) gave Hunting Geophysical Services, Inc. of New York exclusive rights to prospect for minerals in a 1,600,000-acre area, and the company is making a comprehensive aerial survey. During the 14-month contract Hunting has the right to lease as much as half of the lands for mining purposes.

One of the most significant developments of 1959 was the appreciation of the potential of the Mt. Wheeler, Nevada phenacite deposit. The property has been acquired and is being explored and developed by subsidiaries of the Atlas Corporation—this coincides with an increasing demand for beryllium for missiles and aircraft, and a swing in United States interest to gas-cooled nuclear reactors.

In western United States the search for iron has been stepped up by the need for additional reserves: (1) to satisfy the local demand; (2) for export requirements, primarily to

"Probably Missouri continued to be the most active exploration area in the United States. Earlier discoveries by St. Joseph Lead Company of a major lead district near Viburnum, and of the Pea Ridge iron deposit set off a wave of exploration over the entire state and into at least one adjacent state."

Mr. Hoy is a Senior Geologist for Stanford Research Institute, Menlo Park, California.

Japan; and (3) for the development of the direct reduction process of low-grade ores without coke. Companies involved in the quest include Bethlehem Steel Corporation, Colorado Fuel & Iron Company, Utah Construction and Mining Company, Phelps Dodge Corporation, M. A. Hanna Company, Cleveland-Cliffs Iron Company and United States Steel Corporation—the latter reported to be conducting extensive drilling programs in California east of Lucerne Valley and east of San Diego. Fairchild Aerial Surveys performed major airborne magnetometric surveys in a number of areas, as well as the first (in the United States) commercial AFMAG survey of ore bodies in the western part of the country. Nevada iron ore estimates have been increased to assured reserves of 46,000,000 tons of 29.2 percent iron with an additional 86,000,000 tons indicated. Iron ores being developed in other parts of the west include Atlantic City, Wyoming, and Carter Creek, (near Dillon) Montana.

In Missouri during 1959 St. Joseph Lead, Kennecott, M. A. Hanna, American Zinc Lead and Smelting Company with Granite City Steel, and American Metals Climax were drilling for lead, copper, and iron ore with holes to depths ranging from 1,000 to 3,000 feet. Unconfirmed discoveries of copper by American Zinc (and Granite City) are reported near Boss (Iron County) and of lead near Eminence (Shannon County). A recent deep hole in the northeastern corner of the state penetrated a con-

siderable thickness of Precambrian magnetite-bearing gabbro. American Smelting & Refining acquired property in various sections of southeast Missouri, and New Jersey Zinc Company is working out of an office at Salem.

The original discoveries, Viburnum and Pea Ridge, resulted from interpretation of maps from airborne magnetometer surveys—the magnetic anomalies received no attention for several years until St. Joe speculated on deep drilling for lead where topographic highs were indicated on the Precambrian surface. At Viburnum development is progressing rapidly, including mine, mill, and townsite construction. The mill (ultimate capacity of 6,000 tons per day) will be supplied by three shafts arranged at the corners of a triangle three miles on a side. In the Pea Ridge iron deposit—being developed as a joint venture by St. Joseph Lead and Bethlehem Steel—the ore extends in Precambrian from the base of upper Cambrian sediments at about 1,000 feet to a depth of over 3,000 feet. Production is expected to reach 2,000,000 tons per year sometime in 1962.

In North Carolina, Foote Mineral Company's investigations have redefined reserves at Kings Mountain: Measured ore reserves are 20,800,000 tons averaging 1.53 percent Li_2O ; additional indicated reserves of 15,800,000 tons in adjacent deposits brings the total to over 36,000,000 tons. The Tennessee Copper Company

conducted a drilling program at the old Silver Hill mine near Lexington, North Carolina which revealed sufficient ore to warrant establishment of a small operation. Newly discovered deposits of titanium, zirconium, and monazite sands in South Carolina—along streams between Aiken and the Atlantic Coast and along the coast—are reported to be of better grade than deposits now being mined.

Alaska saw considerable activity by major mining companies, small companies, and individual prospectors. Kennecott returned to Alaska—scene of its first big success—to pick up options where its subsidiary, Bear Creek Mining, continued to expand by diamond drilling the Ruby Creek copper deposit near Kobuk. Freemont Mining Company continued drilling its nickel prospect at Glacier Bay. A new copper property, located between Juneau and Petersburg, staked in 1958, was drilled by Moneta Porcupine Mines Ltd. of Toronto. Japanese firms are considering development of a large iron deposit in the Bradfield Canal country north of Ketchikan—being drilled by Standard Slag Company and C. T. Takahashi. The most significant discovery may be a molybdenite deposit 80 miles northwest of Anchorage—announced late in the year by an inexperienced prospector. Near Dillingham, Humble Oil and Gas Company conducted extensive drilling to evaluate a titaniferous magnetite deposit, discovered in 1958 by an airborne magnetometer survey intended for oil exploration.

Stable-Isotope Research Sparks Heated Debate

Refinements in the technology of exploration—better sensitivity in electro magnetic systems, more sensitive and more efficient magnetometers, easier and more rapid methods of analysis, AFMAG, and an air-borne gravity-meter—have considerably aided many discoveries. Where geological associations are favorable, as in the case of nickel, great success is possible. Airborne methods map the basic rock which must be present and the sulphide bodies which contain the nickel. By this simple procedure, International Nickel Company of Canada has been able to make its raw-material position apparently unassailable. Unfortunately, the geological associations of copper, lead, and zinc deposits are much more complicated. Surveys of areas with rocks favorable for these ores frequently reveal innumerable conductors with no indication which might have eco-

nomic value. In some instances (as in New Brunswick) lead, zinc, and copper are in massive sulphide deposits, which can be detected but are easily confused with disseminated sulphides and graphite deposits that are also good conductors. In other localities copper, lead, or zinc minerals may be so dispersed that economic ore bodies provide no electromagnetic or magnetic anomaly. The usual zinc minerals are neither magnetic nor conductive. Obviously, technique must be adapted to the local situation. At Sudbury or Thompson-Moak Lake simple aerial magnetic and electromagnetic surveys locate drilling targets. In New Brunswick, more careful interpretation of electromagnetic maps is required and geochemical prospecting frequently is advisable. In areas where sulphides are disseminated, induced polarization methods are applicable if the depth to ore is not

too great. In areas where sphalerite is found in limestone with little or no lead or iron mineralization, geochemistry is the sole aid to geological methods.

Technical papers presented in the geological and mining publications and at the various society meetings can be very helpful. The work of the U.S.G.S. provides the broad framework by describing mineral deposits, providing accurate areal maps, and developing exploration procedures. Research at universities, colleges, and institutes, and by companies extends our geologic knowledge.

A recent trend is the regional attack on causes of ore localization. S. E. Jerome's paper, "Exploration of Large Areas," (September 1958 Mining Congress in San Francisco, California) was followed by Evans Mayo's paper, "Lineament Tectonics and Some Ore Districts of the Southwest,"

Mining Engineering, November 1958, and Edward H. Wisser's "Cordilleran Ore Districts in Relation to Regional Structure" in the January 1959 *CIMM Bulletin*. P. C. Badgley's discussion, "Tectonic Analysis as an Exploration Tool," was presented at the San Francisco AIME meeting. J. W. Gabelman, at the same meeting, discussed "Tectonic Control of Mineral Belts in the Southwestern Colorado Metallogenic Province." Harrison Schmitt contributed "The Copper Province of the Southwest," *Mining Engineering*, June 1959.

Exploration was a major theme of the 1959 AIME annual convention held in San Francisco in mid-February. Great interest centered on geophysics. AFMAG, the new airborne Audio Frequency Magnetic surveying technique, was described by Stanley H. Ward as having great depth penetration. The Canadian Aero-Newmont helicopter electromagnetic method was discussed by Roger H. Pemberton, who declared that the system had never failed to

"The crying need is for practical methods which will eliminate the unproductive drill hole. Notwithstanding the high cost of aerial surveys and geological mapping and other preliminary expenses, the major cost of a project is diamond drilling. The challenge is to locate the first hole in ore, and to develop the tonnage and grade with a minimum footage of drilling."

locate a known massive sulphide deposit. Various papers described the success of the induced polarization method in locating a porphyry-type copper deposit in Arizona, a southwest Missouri lead deposit, and a vertical sulphide orebody. R. J. P. Lyon used case histories to show how rapid quantitative mineralogy—utilizing infrared absorption, x-ray diffraction, and differential thermal analysis—can guide exploration.

Peter C. Badgley's "Tectonic Analysis as an Exploration Tool" synthesized many ideas to provide a tectonic explanation for one localization. Case histories of successful and unsuccessful projects were provided in papers by D. J. Salt on the vertical coil electromagnetic method; C. P. Jenney on the Mattagami area,

Quebec; Harrison A. Schmitt on the Esperanza copper mine, Arizona; Douglas R. Cook on the Bonanza, Colorado project; and C. G. Cheriton on exploration in the Bathurst district, New Brunswick.

The annual meetings of G.S.A., SEG, etc. at Pittsburgh in November were highlighted by the symposium on the "Role of Stable-Isotope Research in the Field of Ore Deposits."

The Sunday evening discussion developed into a battle between theorists and practitioners. This was touched off in the afternoon by John S. Brown's rebellion at conclusions reached by J. L. Kulp regarding lead-isotope data from Missouri and reached its climax in the evening session, in a heated debate regarding the origin of "recrystalline" dolomite.

AFMAG Used for Western Geophysical Prospecting

In geophysics the accent in 1959 was in evaluating large unexplored areas. Used intelligently and with full realization of its limitations, this sort of work is of great value. One new method which was tested extensively in 1959 is the audio frequency magnetics (AFMAG). Reports from Fairchild and S. H. Ward, *Geophysics*, October, state both airborne and surface instruments are responding as predicted. Test runs of the airborne instrument over known United States

ore bodies were sufficiently successful that considerable work is planned. Examples show advantages over conventional electromagnetic techniques in greater depth penetration, wider choice of operating frequencies, and simpler operation. Chief disadvantage is a sometimes restricted daily measurement period when the natural signal is too low to permit measurement with current instruments. This is not a serious problem and is being corrected.

Another new method is the airborne gravity survey: Fairchild reported successful results with the La Coste-Tomberg system, and Hunting Geophysics also reported progress. Hans Lundberg's trial surveys with the latest airborne gradiometer indicate improvement in technology. A three-component magnetometer for small drill holes in ore prospecting is reported to be in routine use in Finland by A. E. Levanto—*Geophysical Prospecting*, June.

Ion Exchange Resins Make New Geochemical Tool

Geochemical prospecting has passed the stage of being a primary exploration tool and has become a routine part of many well-integrated exploration programs. Waters, plants, and stream sediments have been used for geochemical sampling and assay, but the most popular method uses soils. In any given area, opinions vary regarding geochemical prospecting's value. In exploring the Canadian Shield one outstanding geologist believes that it has little value compared to geophysics. However, another, C. J. Sullivan, president of Kennco Ltd., believes "... that because geochemistry is capable of detecting the presence of the metals sought, rather than some property of the ore deposit, such as conductivity, possessed by innumerable other geologic bodies, the future of geochemistry is very bright."

Sullivan is backing his conviction by spending 3.7 percent of his exploration budget for geochemical work. V. D. Perry, vice president of Anaconda's exploration, has increased geochemical prospecting several fold in the last five years. McPhar Geophysics Ltd. is using traps containing exchange resins which are placed in streams; later they are collected and analyzed for their metal content.

Russian geochemical prospecting is described in recent translations, University of California Press, of papers from a 1955 Russian Symposium. Millions of samples were collected over widespread areas—10,000,000 in 1945 and 1955 and 25,000,000 in the previous 20 years. Among Russian discoveries are several copper deposits in the Kadzharan mining district of southeastern Armenia. In copper ex-

ploration, as in the United States, molybdenum is used as an indicator metal because it travels farther and is more easily assimilated by plant life. The Russians have also found that mercury is an excellent indicator for base metal deposits in some areas.

An interesting development in the United States is the investigation of trace elements in heavy minerals in stream sediments. Theobald, in his study of the Front Range mineral belt in Colorado, was able to trace tungsten 40 miles, and zinc 20 miles from the respective sources.

Southeast of Ashcroft in southern British Columbia stream-sediment sampling outlined a broad target area in the vicinity of the deposit; and assays of soils proved a copper anomaly over the deposit.

Canadian Exploration Shows Increases Over 1958

In Canada, particularly active areas were the Labrador-Quebec Trough for extension of iron ore reserves; the Great Bear Lake area, N.W.T., for copper and molybdenite; the Mattagami area of Northwestern Quebec for zinc; the Highland Valley-Princeton and other areas of British Columbia for copper and molybdenum.

Although most provinces showed increases over 1958, significant discoveries were few. Most widely publicized was the Canadian Tungsten Mining Corporation's report of a more than 1,000,000-ton deposit containing 2.18 percent WO_3 in N.W.T., 600 miles northwest of Edmonton. Even as it is now known, this is the highest grade major tungsten deposit in North America.

At the year's end, a significant copper-bearing deposit was discovered at the MacIntyre Porcupine Mines property in Ontario; drill holes on two

levels indicate a minimum length of 800 feet, grading 1.3 percent copper and 0.02 ounce gold per ton over a width of more than 30 feet. Gold discoveries were reported in the Walmsley Lake region northeast of the Yellowknife district, N.W.T. The 1958 discovery by Murray Mining Corporation of a chrysotile asbestos deposit at the northern tip of Ungava proved to be of sufficient size and grade—at least 7,000,000 tons of \$20.00 grade—to warrant serious consideration.

At Boss Mountain, B. C. over 1,000,000 tons of 0.74 percent MoS_2 has been proved, together with a possible 3,000,000 tons of 0.35 percent. Teck-Hughes, with other firms, has staked a 56-claim group in the North Caribou Lake district, northwestern Ontario. New Jersey Zinc Exploration Company Ltd. has outlined a significant tonnage of massive sulphides on property east of Portage Lakes, N. B.

—unofficial reports suggest higher grade lead-zinc-silver mineralization than others in the district. On Cape Breton Island, Conwest Exploration is drilling a promising new zinc discovery (pure sphalerite in marble) on a 64-claim property. Anthonian Mining Corporation, Cominco, and Consolidated Negus Mines are also exploring in the area.

The Saskatchewan Department of Mineral Resources increased all phases of its preliminary development program. Additional geological parties were placed in the field, numerous reports were published, and the native prospecting plan was activated. L. S. Beck's report on "Mineral Occurrences in the Precambrian of Northern Saskatchewan" is a useful guide for exploration, and other reports have clues which could lead to important discoveries.

Exploration South of the Border Will Expand

Mexico's low rate of metal exploration is the result of low prices and high taxes. The present tax takes up to 50 percent of the gross value of the contained metals. As taxes on non-metallic materials are more favorable, exploration is more active. Some people believe the government will soon reduce taxes in an effort to encourage development of the country's mineral resources.

Largest reported activity is exploration and development of fluorite deposits: by Aluminium Company of Canada and Hearst interests in Esqueda, Sonora; Dow Chemical Company at Agua Chile, Coahuila; DuPont in the Encantada and El Tule districts of northern Coahuila; Asarco

at Aquijuta, Coahuila and in the Paula district; and Penn Salt Company and Empresa Fluorspar in San Luis Potosi.

Many South American countries are at a critical stage in mineral development. Iron deposits in Venezuela, Brazil, and Chile compare in size and grade with the world's best; the same can be said for copper and silver in Peru and Chile, and for Bolivia's tin. However, development frequently has been handicapped by political instability and taxation—despite these, exploration has continued and mining has developed because ore bodies are rich and labor costs favorable.

South American countries are taking steps to improve the over-all

situation. Bolivia, aided by a West German geological mission, is establishing a Geological Service, which will inventory the country's natural resources. In Chile the Instituto de Geología completed its second year of operation; under the United States Technical Aid program six United States Geological Survey geologists and two United States Atomic Energy Commission geologists are assisting. The Institute has geological laboratories and prepares topographic and geologic maps from aerial photographs; numerous quadrangle maps and several reports have been completed. The University of Chile, with the assistance of Stanford University, is establishing a school of geology.

African Ore Search Goes Ahead on Many Fronts

In Africa, exploration is proceeding on a grand scale. An aerial magnetic and radiometric survey was begun in Nyasaland to assess iron ores and radioactive mineral deposits. Late in 1959 Fairchild Aerial Surveys (Los Angeles, California) flew 15,000 line miles of the first aerial mineral survey of Morocco—an example of the trend among African governments to encourage more rapid resource development.

Rhodesian Selection Trust group (with American Metals Climax, Mond Nickel Exploration, and Metals Separation) announced it had been granted prospecting rights for 40,000 square miles of Bechuanaland on lands of the Bamangwato tribe.

As a result of large geological surveys, the Bureau of Mines of Overseas France announced discovery of a 500,000,000 ton bauxite deposit between Tibati and Ngaoundere and a 100,000,000 ton iron deposit near Kribi, both in Cameroon.

Bethlehem Steel Corporation joined with Liberian-American Swedish Minerals Company to develop the Mount Nimba (Liberia) iron ore deposit. The government has approved an agreement to mine the 20,000,000 ton deposit containing an average grade of 65.5 percent iron. Total Liberian iron ore production should reach 15,000,000 tons in the 1960's.

In Sierra Leone the Tonkolili iron ore deposit was announced to contain

400,000,000 tons of more than 60 percent Fe. An annual production of 5,000,000 tons is planned. Exploration in Sierra Leone, the Colonial Office reported, has located sufficient molybdenum and lead minerals to warrant further investigation.

A large survey of Southern Rhodesia's chromite deposits indicates thousands of millions of tons of possible ore. Rand Mines Ltd. committed \$364,000 to prospect a 500-square-mile area, 40 miles northeast of Karoi, on the strength of copper assays reported at 2.5 percent and above. An extensive deposit of high-grade cesium oxide was reported by Bikita Minerals Ltd. near Fort Victoria. This is part of the lithium-beryllium deposit Bikita (owned by Rhodesian Selection

Trust, American Potash and Chemical, and American Metal Climax) has been developing for several years.

A 30,000,000 ton deposit of 1.34 percent C_2O_5 was discovered in Kivu in the Belgian Congo by Somikubi-Comite National du Kivu and Compagnie Minière des Grands Lacs African. This occurs as pyrochlore in "carbonatite" similar to the 300,000,000 ton deposit at Panda Hill, Tanganyika and other deposits along the Rift Valley of Central Africa.

European discoveries include an East German nickel deposit said to be Europe's largest; a 400,000,000 ton, 42 to 48 percent iron deposit in West Germany; a large copper deposit near Glogaw, Poland; a bauxite deposit in the Nyirad basin in Hungary; lead-zinc deposits on Ruen Mountain and on Kopsonik Mountain in Yugoslavia; magnesite at Bela Stena, magnetite at Arandjelovac, and lead at Kusmoj, all in Yugoslavia; 20,000,000 tons of ore of copper, zinc, and precious metals in Finland; a molybdenum deposit in Sardinia; a high grade copper deposit in Norway; large tonnages of copper

in County Cork, Ireland; and additional orebodies at South Crofty Ltd. mines in the United Kingdom.

In the United States and Canada uranium exploration continued to be relatively dormant. However, in certain foreign countries uranium exploration continued apparently unabated. In Mexico deposits found in Chihuahua were included in the national mineral reserves. In Japan deposits have been reported in the border between Tottori and Okayama prefectures and in Tottori and in Iwata. Extensive discoveries were reported in the Paparoa uranium province of New Zealand in an area geologically similar to the Colorado Plateau. Fissionable materials reportedly discovered on the Sinai Peninsula are to be evaluated by the United Arab Republic's AEC. India is attempting to increase its reserves—reported at over 30,000 tons uranium and 500,000 tons thorium—by drilling in the Tiruchengode area and in the Suryamalai Hills in Salem district of Madras State. Additional deposits have been developed at Umra and

Jaduguda (Bihar).

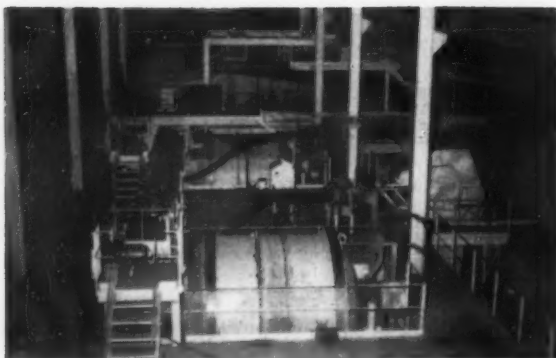
In summary, the major trend of exploration techniques is toward large-scale integrated surveys. These tend to give more careful consideration to selection of exploration areas, through investigation of regional features such as tectonics or metallogenic provinces. Statistical analysis and geological quantification are being used to aid in making decisions that previously were based on "hunches" or at best on educated guesses. This approach narrows the exploration target by combining results obtained in geological mapping and geophysical and geochemical surveys.

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Recommended books on geology, geophysics, and exploration published recently

TITLE	AUTHOR	PUBLISHER	YEAR	PRICE
Researches in Geochemistry	P. H. Abelson, ed.	Wiley	1959	\$11.00
Introduction to Geophysics	B. F. Howell, Jr.	McGraw-Hill	1959	9.00
Our Mineral Resources (An Elementary Textbook in Economic Geology)	C. M. Riley	Wiley	1959	6.95
Basic Geology for Science and Engineering	E. C. Dapples	Wiley	1959	9.50
Explorations East of the High Andes	V. Oppenheim	Pageant	1958	5.00
Geophysical Surveys in Mining, Hydrological and Engineering Projects (European Association of Exploration Geophysicists)	O. Koefald, ed.	E. J. Brill (Leiden)	1958	
Aerial Photographic Interpretation	D. R. Lueder	McGraw-Hill	1959	17.50
Dana's Manual of Mineralogy	E. S. Dana, Revised by	Wiley	1960	11.75
17th Edition	C. S. Hurlbut, Jr.			(tentative)
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Principles of Geochemistry 2nd Edition	B. H. Mason	Wiley	1958	8.50
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1. DRUM SEPARATORS, each 10 by 10 feet make gravity separation at Oliver Iron Mining Division's Trout Lake concentrator.



2. HyL SPONGE IRON plant of Hojalata y Lamina S. A., Monterrey, Mexico uses 21,000 cubic feet of natural gas per ton of sponge.

IRON ORE BENEFICIATION'S four fronts—

During 1959 there was much research and pilot plant work on iron ore beneficiation—particularly for the hundreds of millions of tons of mixed magnetite and hematite of the Quebec-Labrador trough in Canada.

There was, however, no unanimity of opinion as to the best method to treat these ores most economically. Perhaps there never will be the utopian flowsheet because of the wide physical and mineralogical differences in this iron-bearing material. It will become ore only by the expenditures of hundreds of millions of dollars, building of railroads, shipping ports, and establishment of new and complete cities in the wilderness.

With such vast sums to be spent and the fast-changing picture in iron ore beneficiation, large scale pilot plants were operated by Iron Ore Company of Canada at Carol Lake, while Quebec Cartier Mining Company and Wabush Iron Company evaluated flowsheets using wet and

dry grinding and magnetic separation, and gravity concentration with spirals.

In Sweden, new hematite flotation mills were built and operated at two mines, as described in the European Metallurgical Review in the Technology Section.

Many European metallurgists declared their preference for autogeneous dry grinding with dry magnetic separation. Other metallurgists favored wet grinding and separation. The dry proponents quickly outlined the advantages of dry processing in the cold and fuel-less northern region of Scandinavia and Canada.

This review will attempt to outline some of the test work and methods under investigation, and, where appropriate, point out the reasons behind them, as well as experiences and test indications to date. However, in 1960 or in any foreseeable year, no final conclusion will be reached as to the best flowsheet. Every ore will have to be treated under optimum conditions

for that mine and owning company.

The one conclusion more apparent than ever before in 1959 was that the blast furnace operator was calling the tune and it was up to the miner and metallurgists to play in harmony or get out of the act. With so many sources of so many types of ores, concentrates, and agglomerates available from all over the world, the blast furnace operator could pick and choose exactly which furnace feeds would give him the greatest number of iron units per ton of charge, per furnace operating hour, and with the lowest coke consumption.

Therefore, iron ore beneficiation mills will continue to be more important and will play an expanding role in determining which mines are operated, and almost which mining companies stay in business. Metallurgists must continually seek to produce higher grade products and recover the finer-sized fractions which formerly were lost.

1. Gravity methods widely used for many size fractions

Oliver Mining Division's Trout Lake concentrator at Cooley, Minnesota was expanded to handle fine iron ore fractions in its feed, reported the March 1959 issue of MINING WORLD. A recent addition to the plant houses a standard heavy-media section to treat plus- $\frac{1}{2}$ -inch material and a cyclone heavy-media circuit to recover iron in minus- $\frac{1}{2}$ -inch, plus- $\frac{1}{2}$ -millimeter fractions. Feed to the new section comes from the old washing plant.

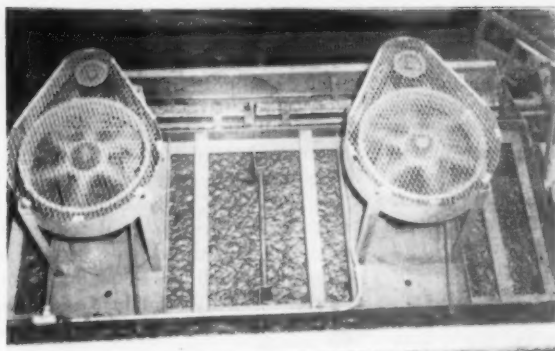
Cleveland-Cliffs Iron Company operates similar plants at Canisteo, Holman-Cliffs, and Hill Trumbull on the

Mesabi Range. A fourth Cleveland-Cliffs plant, the Cushing, will do the same. The German Salzgitter iron ore plant is employing washing, cyclone heavy media and high-intensity magnetic separation, with machines of special "Salzgitter" design. Caland Ore Company's Steeprock, Canada flowsheet uses nearly all of the tools developed for gravity treatment of iron ore. Washing, HMS, spirals, jigs, and cyclones produce coarse and fine concentrates.

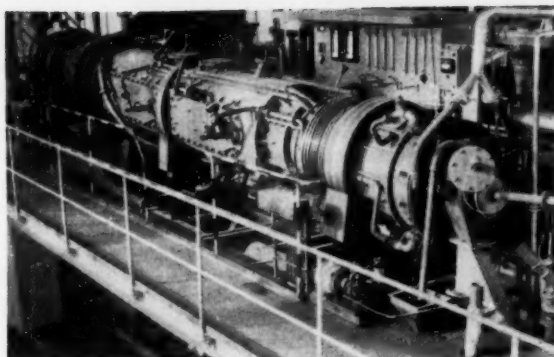
M. A. Hanna Company's Groveland, Michigan plant uses Humphreys'

spirals on plus-28-mesh feed with flotation to concentrate finer fractions. Oliver Mining Division plans construction of a 1,500,000 annual ton HMS-spiral plant for Mesabi Range ores mined from the Monroe-Sherman mines. Other spiral plants are Cleveland-Cliffs' Canisteo and Holman-Cliffs plants, and Jones & Laughlin's Hill-Annex Arthur operation. Mills for Canadian specular hematite ores from Mount Wright are considering spirals as concentrators for "coarse" ore recovery.

Dorr-Oliver, Inc.'s "Siphon Sizer" (formerly the Evans Hydrosizer) shows



3. FATTY OIL FLOTATION has proved successful for Michigan jaspellite; will be used for Canadian specular hematite ores.



4. LURGI ROTARY KILN which will be used at a pilot plant on the Mesabi Range for magnetizing roasting of hematite.

gravity, flotation, direct reduction, magnetizing roasting

promise as a gravity aid to magnetic separation. This hindered-settling classifier is being tested as a device to

segregate flocculated magnetic concentrate particles from freed gangue minerals to improve magnetic con-

centrate grades. Other testwork is applying the sizer to more orthodox, classifying functions.

2. Direct reduction proves commercial for Mexican plant

One observer, close to the United States direct reduction scene, predicts that DR will establish a basis for a "grass roots" steel industry—into which existing steelmakers and newcomers can expand. Those areas, such as the southwest United States and western Canada, which have ore, fuel, and a nearby steel market are considered as likely DR locales.

H. W. Kellogg Company is building what is reputed to be the World's largest DR plant for Fierro Espanaja,

Monterrey, Mexico. The new 500-ton-per day plant, designed around the HyL batch process, will be located near an existing 200-ton operation, which was described in the December 1959 issue of MINING WORLD.

Republic Steel Corporation and National Lead Company's R-N pilot plant in Alabama has been subjecting a variety of iron ores to R-N kiln reduction, including an Italian ore imported for treatment and exported as R-N product. Republic has also demonstrated the conversion of iron ore

powder to a strip steel which exhibits favorable strength and drawing characteristics.

Application of DR to Australian hematite has been a subject for the attentions of Broken Hill Proprietary Company's Central and Newcastle Works laboratories. Two processes are under study: in one, both a gaseous and a solid fuel reduction is involved; while in the other, a combination of hydrogen and carbon monoxide is the reductant.

3. Flotation will be used for Canadian specular hematite

Flotation of iron ores has been widened to include Minnesota's earthy hematites. Jones & Laughlin's Hill-Annex Arthur plant uses petroleum sulfonate flotation to extract hematite from deslimed, finely-ground spiral tailings.

Other flotation plants in Michigan which treat specular hematite use

reagents of the fatty acid type. These are the all-flotation plants at Republic (Marquette Iron Company), Humboldt (Cleveland-Cliffs-Ford Motor Company) and the spirals-flotation Groveland plant (M. A. Hanna). Humboldt is currently being expanded to a capacity which will equal that of Republic.

Fatty acid flotation circuits are also successful at Jones & Laughlin's Benson Mines, New York to concentrate martite ore, and at Tahawas, New York (National Lead Company) to differentially separate iron and titanium minerals. Similar circuits will be used in the Canadian spirals-flotation specular hematite flowsheets.

4. Magnetizing roasting will be tested on Mesabi Range

Magnetic concentration flowsheets are successful for concentrating lean iron ores. Predictions are that Erie Mining Company's 8,000,000 annual ton design capacity will be exceeded, so that even higher tonnages will be

produced in Minnesota. Other important plants are at Kiruna (Sweden), with expected annual output of 16,000,000 tons, and the 4,500,000-metric tons which each of seven Russian plants at Kriwoj will recover each

year. Canadian magnetic separation plant production amounted to nearly 2,000,000 tons in 1958, and new development plans for the area will increase magnetic concentration capacity considerably.

Magnetic concentration of the dry type is being contemplated for flowsheets at northern mills. One such flowsheet incorporates dry crushing and grinding in an autogeneous mill, dry cobbing of coarse fractions, and wet magnetic treatment of finer material. Among separators which could perform dry concentration tasks is the Swedish Sala Mortsell dry type. This machine employs many magnets in a special polar arrangement. The manufacturer claims that more non-magnetic particles are centrifugally released from the drum as magnetic particles rotate to align themselves with a rapidly shifting field.

High intensity magnetic separation has usually been a dry concentration operation in Europe. A comparatively

recent English development has made the operation wet, with designs by Jones. A revival of interest is reported in magnetic separation of hematite by means of alternating current magnetic fields which use the coercive forces of more weakly magnetic materials to effect their separation from non-magnetic gangue minerals such as quartz.

Commercial application of magnetizing roasting seems near, according to reports originating from three continents. Russians have reported that agglomerated produced from artificial magnetic oxides can be smelted to pig iron at costs lower than those from other beneficiated ore products. Tests by the University of Minnesota Mines Experiment Station have demonstrated promise for a new traveling

grate roaster. Australians have subjected a tandem shaft-roasting furnace to close scrutiny and are weighing its commercial possibilities. Lurgi, Frankfurt Main, Germany has conducted tests with minus- $\frac{3}{4}$ -inch Ungava, Quebec ores. Roasting at this size would be economically sound, it is reported.

A successful magnetizing roasting method would encourage development of non-magnetic taconites, semi-taconites and jaspillites. Flotation is currently the only working, economic process being applied. However, M. A. Hanna Company and Oliver Iron Mining Division will build magnetic roasting plants on the Mesabi Range. Lurgi has sold two units to United States iron mining companies.

Autogeneous grinding used for several iron ores

Size reduction components of iron ore flowsheets have been the subject of a great deal of study. One goal seems to be minimizing the number of equipment units necessary for a given size reduction. Proponents of the autogeneous approach claim that sizeable reductions in housing, floor space, personnel, and possibly power consumption are achievable. They also point out that economies might be realized in the operation of isolated mills, to which the shipping of conventional grinding media for standard mill circuits might prove to be expensive.

Aerofall Mills, Ltd.'s Aerofall mill and the Hardinge Company, Inc.'s Cascade mill have spearheaded current developments in autogeneous

grinding. The Aerofall mill made its debut in the iron ore field at Jones & Laughlin Steel Corporation's Benson Mines, New York. The cascade, a modern version of the Hardinge-Hadsel mill, is reportedly to be used by Quebec Cartier. Flowsheets which could employ these mills are for treatment of non-magnetic ores, such as Canadian specularite and Minnesota hematite, in spirals-flotation concentration plants. However, some thought is being given, particularly in Sweden, for their use for dry magnetic separation of magnetite ores.

Still generally favored for magnetite treatment is progressive, crush-grind flowsheet. Both established and projected magnetite plants incorporate cobbing stages to strip coarse, non-

magnetic fractions early in the concentration operation to prevent overloading of later stages with superfluous waste minerals.

Interest in impact and hammer-milling as well has been due, in part, to recent German success stories. United States companies have studied their use for secondary and tertiary crushing of dry and wet-sticky iron ores. Many designs are available. Movable breaker plates seem necessary in crushing flowsheets for wet-sticky ores. High speed ball milling, pioneered by Finland Technical Research Institute's R. T. Hukki, continues to sustain interest. Published reports show a 40 percent increase in capacity of ball mills rotated faster than critical speeds.

High tension separator capacities prove excellent

Specular hematite has demonstrated a high degree of response to electrostatic, high tension concentration on a pilot plant basis, only. Experimental work on Canadian ores has yielded concentrates of plus-65-percent iron with recoveries approaching 90 percent.

As in the case of high-intensity separation, the electrostatic method works best with closely-sized feeds. Other factors which are important for good response are moisture level and the geometry of electrostatic fields. Capacities have generally been excellent. Machines being marketed for the process include Carpco Manufactur-

ing's High Tension separator, and Ding Magnetic Separator Company's "Coronatron," a design originally conceived by the Quaker Oats Company. Both are rotor type separators in which the rotor serves simultaneously as the means to introduce material into the electric field and as one of the field electrodes.

Lime addition before agglomeration looks important

Iron ore and concentrate agglomeration with lime added to self-fluxing levels looks important. The cost advantage of calcining limestone with cheap sintering fuels, rather than expensive blast furnace coke, has prompted much of the discussion.

Blast furnace experience with self-fluxed sinter burdens has indicated other favorable factors as well.

The history of self-fluxing at Domnarvet, Sweden, dating back to World War II, has shown that 100 percent self-fluxed charges and other changes

resulted in a 40 percent decrease in coke rate and a doubling of furnace capacity over lump ore. The Steel Company of Canada recently reported higher production rates, higher gas-solid efficiencies, the elimination of

carbon dioxide, and higher and more uniform bed permeabilities with 100 percent self-fluxed burdens.

New sintering plants are typified in practice by the McClouth Steel Company's agglomeration facility at Trenton, Michigan. Two-stage mixing, a pug mill mix preceding a secondary disc balling yields a more permeable

bed due to the "pelleted" character of the charge to the sintering strand. Many sintering plants are adding limestone or hydrated lime in amounts below self-fluxing levels in another move to improve sinter bed permeability and, consequently, production rates.

Allis-Chalmers Manufacturing Com-

pany's kiln-grate (pelletizing) will be introduced for iron ore agglomeration on a commercial scale at the Cleveland Cliffs-Ford's Humboldt, Michigan plant. A 120-foot kiln will be used. Highest temperature is used in the kiln, while sinter preheating and cooling functions are assigned to the grate.

Automatic controls now used for more applications

Instrumentation has been successfully used for materials handling, agglomeration, and to some extent, grinding.

In Sweden, Kiruna's Central Plant includes such instrumented functions as car loading, prevention of car overloading, automatic sampling, and electronic car-number scanning. (See

May 1959 MINING WORLD.) Marquette Iron Company's Eagle Mills pellet plant employs a Transway, resistance strain gauge system to record weight of concentrate being belt-conveyed to a ball milling circuit.

The Ramsay Instrument Company has developed a coil useful as a magnetic sensing device for many Minne-

sota mill functions, among them being the measurement of flowrate, the control of belt conveyors, and the control of specific gravity of media in HMS plants. Gravity separation plants on the Mesabi Range which use "ball-less" ball mills for scrubbing employ automatic pulp density controls rather widely.

Preparation of ore from underground mines

High production costs and strong competition from highgrade pellets and foreign ores have placed Lake Superior underground mines in an uncomfortable marketing position. Minnesota Department of Taxation figures show that underground mining costs are roughly twice as high as open-pit mining. Moreover, assays reveal some serious quality deficiencies in underground ores in this age of high quality blast furnace feeds. To stay in the mining business, underground mines are thinking beneficiation.

Beneficiation is as simple as crushing and screening with coarse fractions being shipped as "ore" and fines as sinter feed. More elaborate plants

use HMS to reject silica and kiln drying to reduce moisture. Sintering of all, or part, of an underground ore is being considered as a means of improving structure and/or reducing high sulphur.

Many of the underground operators on the Lake Superior ranges are using or are planning beneficiation plants. Cleveland-Cliffs treats a substantial parts of its underground ores in an "ore improvement plant" at Eagle Mills, Michigan. Ores are crushed, kiln dried, screened and treated by HMS. North Range Mining Company—W. S. Moore operate a simpler plant at the Zenith mine, Vermilion Range. Pickands Mather & Company plans

crushing and screening facilities at its Gogebic Range operations.

Wet-sticky ore presents special material handling problems to some underground mine operators and has led to experiments with unorthodox materials handling techniques. The Royer sand conditioner has been tested at three mining operations in Michigan, and a wobbler feeder is under trial as a combination sizer-feeder for secondary, underground crushing flowsheets. Sizing by the Royer is accomplished with an endless, inclined belt stickled with short "sprigs." The wobbler feeder's key mechanism is a bed of rotating, elliptically-shaped bars, "pitched" to maintain spacing.

Research and development develops along two lines

Research activity in the iron ore beneficiation field appears to follow two lines: 1) Industrial laboratories seem to be most strongly concerned with applied and developmental flowsheet projects. 2) Government and/or college and foundation laboratories are probing into more fundamental areas. Some overlapping does occur, however.

The more recent developments in sponge (direct reduction) have been within the industrial development group. However, the U. S. Bureau of Mines reportedly plans to revive research in this field in which it has been inactive since 1954. Canadian ore flowsheets have occupied much of the time of major industrial laboratories. Nevertheless, expansions of

Lake Superior plants and underground ore projects have demanded their share of attention.

Study in college laboratories in 1960 will include electroosmosis and sonics for iron ore concentrate dewatering, flotation and the balling of the pellets. Some are continuing projects sponsored by the U. S. Bureau of Mines. Research with the reduction magnetic separation process (magnetized roasting) will be accelerated because of the world-wide interest in its applications.

A proposed natural gas pipeline from Canada would provide Wisconsin and upper Michigan areas with a new source of fuel. One condition for entry of natural gas to upper Michigan is the guarantee of a large-scale

customer such as the mining industry for firing pellets, magnetizing roasting, and drying concentrates. The rate calculated for Michigan users appears lower than the cost of propane or oil, but somewhat higher than for coal.

Intensified international exchange of technological equipment, ideas, and personnel will continue. New iron ore plant designs are therefore becoming less provincial and more international in philosophy. Developments in adjacent mineral fields and other areas of engineering are being watched closely and being integrated into plant flowsheets where applicable. The boundaries of the "field" of iron ore preparation are consequently becoming more and more hazy. END

European Ore Dressing Features Research,

New Flotation and Filtering Equipment, Changes in Grinding and Classification Circuits, Swedish Mills Floating Hematite

By Pierre Gy

European mineral processing in 1959 witnessed a transition in a continuous evolving scheme. The four most important developments were: The discovery of a very original concentration process in Italy by Dr. Ing. Micheletti; metallurgical progress in several great African projects, under French supervision; developments in iron ore concentration (both in research and commercial operation); and inauguration of three new laboratories devoted to mineral processing in the United Kingdom, Eastern Germany, and France.

This annual review covers new plants, technical developments, and machinery improvements in the area of "old" Europe, including most countries behind the Iron Curtain. The Belgian and French territories of Africa, belonging to the European economic sphere, are also included.

The importance of European mineral processing was dramatically pointed out when 33 of the 48 technical papers presented at the International Ore Dressing Congress in London, just finished were by European authors. The wide diversity of subjects and the great variety of minerals being processed as described in these papers shows the versatility of European operating and research metallurgists.

New Research Facilities

Research in the field of ore dressing is given more and more attention in western and eastern Europe. It is very significant to note the recent opening of three new laboratories.

United Kingdom: The Warren Spring Laboratory was built by the Department of Scientific and Industrial Research (D.S.I.R.) to carry out fundamental research and sponsored work in four branches, including mineral processing.

Eastern Germany: The Freiberg Institute of Ore Dressing (Forschungs Institut für Aufbereitung) has been built by the Academy of Sciences of Eastern Germany in the heart of the very ancient mining district of the

"Erzgebirge" (ore mountains). This institute will certainly be one of the more modern and best equipped in Europe.

France: "Minerais et Métaux" Company, which since 1920 operated a mineral processing laboratory, enlarged and completely reshaped its installations. Its activity is mainly devoted to sponsored work for companies operating all over the world, although some fundamental research is also carried out.

Iron Ore Concentration

Europe is paying more and more attention to the concentration of its iron ores.

France: Due to the importance of the reserves of non-magnetite ores, IRSID (Institut de Recherches de la Sidérurgie) has developed with Prof. Forrer a high intensity separator working in water on fine size fractions.

Sweden: A great deal of work has been undertaken on iron ore flotation, and on flotation concentrate agglomeration. It has been shown that the flotation reagents, adsorbed at the surface of the iron oxides, were responsible for the bad agglomeration results. Dr. Eketorp developed a rotary kiln for magnetizing roasting, which is still under pilot scale testing.

Czechoslovakia: The beneficiation of the low quality ores abundant in this country has led to research in magnetizing roasting (only modern industrial units in the world), in high and medium intensity magnetic separation of siderite ores, and in sintering. It should also be pointed out that Czechoslovakia is trying to widen the application field of the Krupp-Renn process to its chamosite ores from Bohemia, using low quality cokes produced nearby.

Non Ferrous Metals

Research has always been important for these metals.

France-Mauritania (West Africa): The so-called "segregation process" has been tested in a pilot plant on the oxidized copper ore from the Akjoujt mine, after several years of laboratory work carried out in Paris. The good results obtained represent a great step towards the full scale operation planned for the treatment of 1,100 metric tons per day.

France: The erection, by Penarroya, of a lead and zinc "Imperial Smelting" furnace (Avonmouth process) has forced several mills to reconsider their flotation flow sheets. In the future will it be more economical to produce a bulk lead-zinc concentrate or to go on separating lead and zinc minerals? Anyway there is not yet a market for bulk concentrates, and these problems will be given an answer in due time.

As a general rule it seems that selective flotation will remain more economical for easily treated ores, whereas bulk flotation will be preferred for difficult ores, the differential separation of which is either impossible, very expensive, or yields low recoveries.

France: Professors Rey and Formanek have experimented a great deal with the selective flotation of lead and zinc ores, especially when totally or partly oxidized. The metallic iron resulting from abrasion in rod and ball mills has been recognized as a factor improving selectivity.

Sweden: The Boliden Company reports a fundamental study of the same phenomenon. This study has led to a better understanding of some factors, and has resulted in advanced metallurgy of some ores. The role of mixed collectors on the flotation of complex ores has also been investigated.

Belgian Congo: The Union Minière du Haut Katanga was still trying to improve the flotation of its oxidized copper ores with the use of crude palm oil; cheap in this country. The selective flotation of Zn-Cu-Pb ores from the Prince Leopold mine encounters some difficulties due to the fact that copper and lead contents are very low as compared with zinc.

Poland: The beneficiation of low grade oxidized zinc ores is a problem of national importance. It does not seem so far to have received a satisfactory solution, either by flotation or ammonia leaching. The erection of an "Imperial Smelting" furnace was also under study.

Industrial Minerals

France: The only important piece of research carried out in this field seems to be study of concentration by calcination and leaching of the calcareous phosphate ores (Comptoir

Mr. Gy is Technical Manager for the Societe Minerais et Metaux, Paris, France. A great deal of the information used in this article was obtained on his recent and extensive tour of European metallurgical plants.

Cascade Grinding, New Dry Concentrator

des Phosphates d'Afrique du Nord).

Processes

Italy: The discovery made in 1958 by Dr. Ing. Micheletti (*Un nuovo metodo magneto-elettrico di preparazione dei minerali—Industria Mineraria* August 1959) was disclosed in 1959.

It is the application to ore dressing of a fundamental law of electricity which can be expressed as follows: "A conductive liquid placed in a magnetic field and submitted to an electric current is subject to a force acting like an increase or decrease of density (when magnetic field and electric current are conveniently chosen)."

This property may be used to carry out sink and float separations in true liquids having relatively low specific gravities. The author reports the possibility of increasing the density of a saline solution by several units. It is wondered whether and how this process could be transposed to an industrial scale. Anyway we look forward to new papers by Micheletti.

USSR: It seems that Russian professors have a special liking for the theory of flotation. They have already published numerous works on this subject and presented five new papers in London (Plaksin, Ejgeles et Volova, Klassen, Glembotsky, Bogdanov et Podnek, Haimman and Michailova).

Czechoslovakia: Research seems to have been concentrated on flocculation (Spätzl, Sebor, Slokan, Spaldon).

United Kingdom: The dry concentration of sands has been studied by J. R. F. Joyce who has developed the Joyce-Martiensson concentrator. This concentrator is based on the principle that dry sands flowing at uniform speed in an inclined trough tend to segregate. The trough is perforated in such a way that the dense minerals pass through the holes whereas the gauge materials remain in the upper part of the trough.

The Joyce Martiensson concentrator can be used for instance in the preconcentration of black sands carrying ilmenite, rutile, zircon.

France: A new type of flotation impeller designed by Rhodoz has been tested by Penarroya and Minerais et Métaux. It is reported to decrease power consumption and in certain instances the reagent consumption, and to make it possible to recirculate middling products on the same level by direct suction without introducing a pump in the circuit.

Another important advantage of this impeller is that it can be started

in a thickened pulp. This avoids emptying the cells after a casual current failure occurs. This new impeller seems to combine qualities, belonging so far to different types of impellers.

Norway: Professor Mortenson from Trondheim claims the discovery of a new flotation cell running with a very low power consumption. Reports of actual results have not been received.

Belgian Congo: The filtration of chemical precipitates and leaching residues is a problem considered as very difficult. The Union Minière du Haut Katanga has tested a new model of a drum type vacuum filter, the cloth of which parts from the drum at every turn and can be submitted to a complete washing, preventing the cloth from clogging. Complete success is reported in a pilot unit.

Acquisition of Know-How

Sweden: The Boliden Company reports many improvements in the grinding circuits of its concentrators.

At the Boliden mill the secondary (final) grinding stage is carried out successfully with screened pieces of ore. Old ball mills have been converted to grate discharge mills. They receive rod mill discharge. The ores treated are complex Cu-Pb-Zn containing pyrite and arsenopyrite.

At the Vassbo concentrator the lead ore with a sandstone gangue wet ground is one single stage in a 22 by 7 foot Hardinge cascade mill before flotation.

At the Laisvall concentrator both primary rod mills have been equipped with grate discharge liners. A 10 percent increase in capacity compared with overflow discharge type mill is reported.

Classification in grinding circuits is now done with cyclones instead of mechanical classifiers, in both the coarse as well as in finer classification stages. Savings are made in cost and maintenance.

In the field of automatics it has been shown that automatic pH control in all flotation circuits was paying off in reagent saving and in improved metallurgy. Grinding capacity is increased by automatic density control based on the twin bubble column principle.

Filtering and drying of concentrates to a very narrow moisture variation is achieved by automatic density and pulp ratio from thickener to filter.

Belgian Congo: In hydrometallurgical plants where so many thickeners are utilized, the use of natural or

synthetic flocculating agents, combined with automatic control of discharge density, is reported to increase thickening capacity.

New Plants in Operation

Sweden (iron): Two flotation plants of iron ores have recently been started. At Norberg (Norbergs Gruvförvaltning) an apatite concentrate is first floated followed by flotation of iron oxide with a tall oil (fuel-oil) collector. The plant treats 500 tons per day.

At Hälsberg (AB Statsgruvor) slimes are floated with the same reagent combination as at Norberg.

At Strässa (Trafikaktiebolaget Grängesberg Oxelösund) a new 1,000,000 tons per year concentrator was started. The ore, magnetite and hematite, is concentrated on magnetic separators, spirals, and diagonal tables.

Austria: A flotation plant was built at Hochfilzen (Tirol) To separate magnesite selectively from a dolomite and limestone gangue. It is the second plant of this type built in Austria for Österreichische-Amerikanische Magnesit AG.

Projects

Yugoslavia: This country is certainly one of the most intensely mineralized areas in Europe. A flotation plant for the treatment of 12,000 tons per day of low grade copper ore (0.83 per cent Cu) is being erected at Majdanpek. It will be started in 1961. In connection with the Majdanpek project, the construction of a copper smelter was also started and is to be completed by 1961. Its capacity will be 55,000 tons per year of blister copper. It will also receive flotation concentrates from Bor mine.

France-Senegal: Near Dakar, in West Africa, the Taïba phosphate mine, belonging to the Compagnie Sénégalaise des Phosphates de Taïba has been equipped with a desliming-flotation plant to be started early in 1960. Flotation will produce very high grade phosphate concentrate.

Acknowledgments

This article has been written thanks to the kindness of all those, professors, scientists and engineers, from both sides of the Iron Curtain, who gladly gave me information concerning mineral dressing progress in their countries.

This list is too long to be printed here. To all of them, I wish to express my gratitude. **END.**

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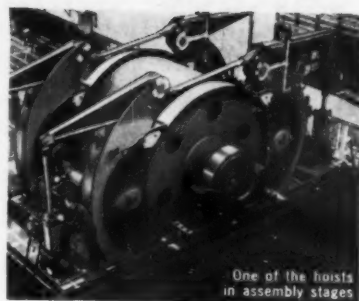
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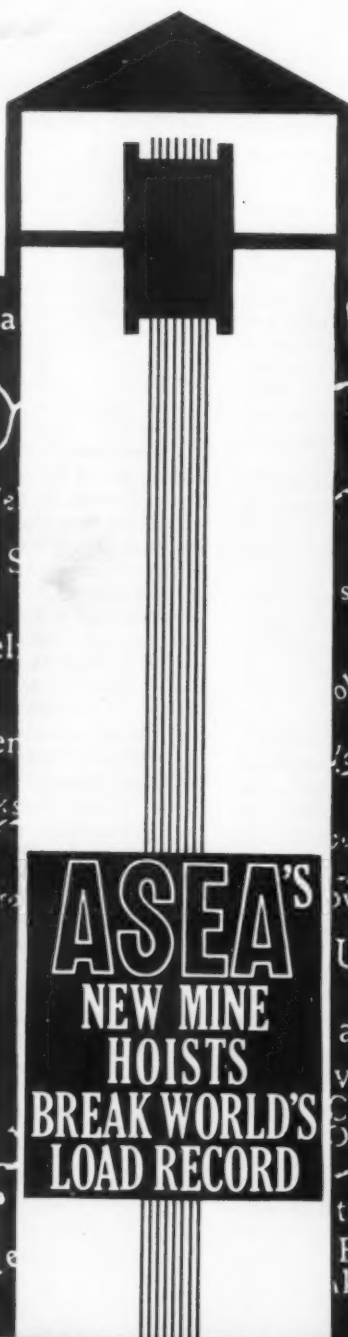
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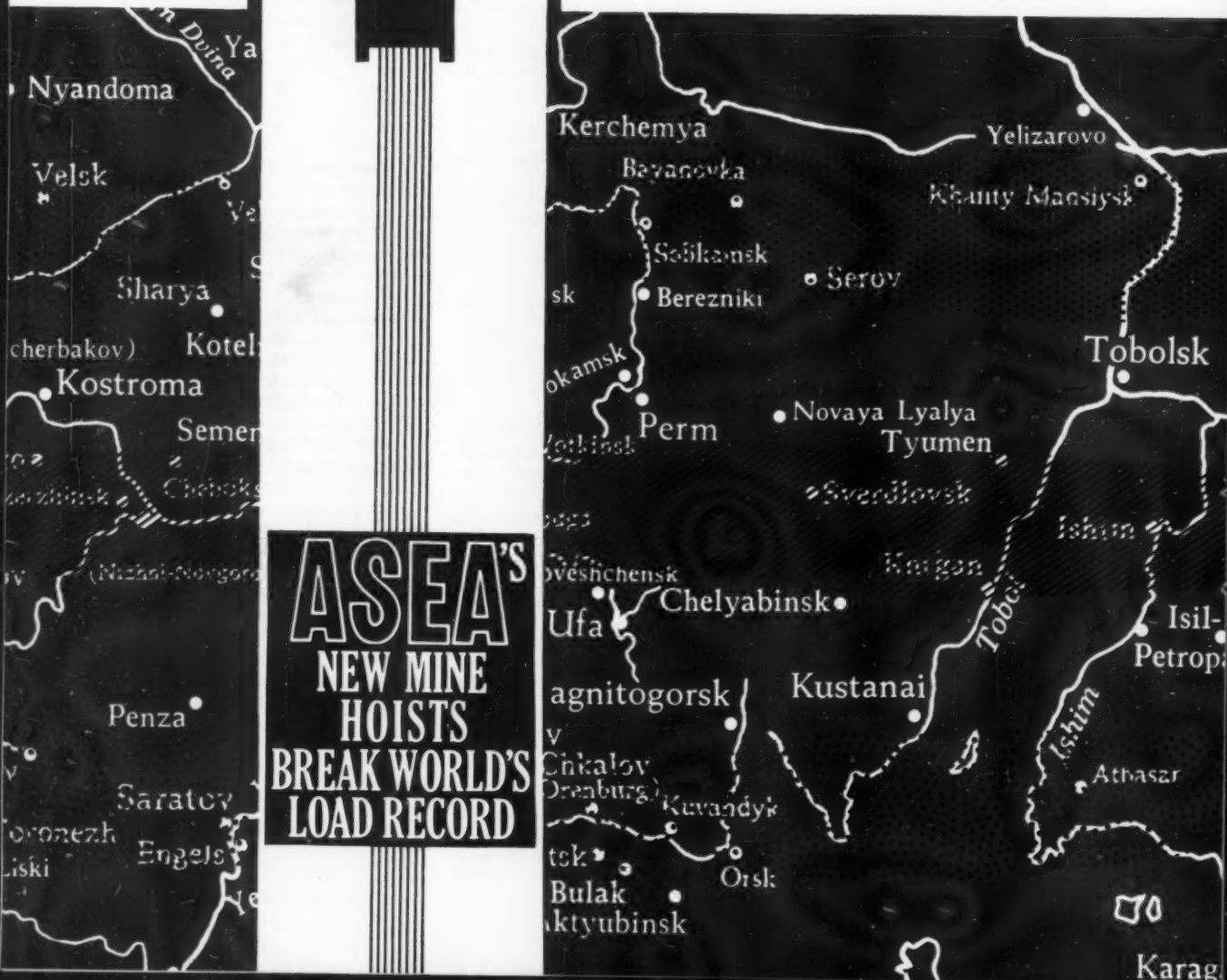
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METALS AND MINERALS

review and forecast

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Stanley H. Dayton
Associate Editor

ALUMINUM

"All indications are that aluminum will continue to be the star performer of the metals industries"

Aluminum bounced back rapidly from the 1958 recession, and 1959 production of primary ingot established an all-time record of 1,953,000 tons. Similarly, sales to consumers amounted to about 2,450,000 tons compared to the previous high of 2,050,000 tons in 1956.

Leading producers predicted a 10 to 20 percent increase in 1960 shipments at the start of the new year. All indications are that aluminum will continue to be the star performer of the metals industries.

The industry's rush to expand producing facilities in 1957-58 and continuing into 1959, resulted in some excess capacity. The highest operating rate attained in 1959 was 91 percent of capacity, reached in July, 1959. For the year, operating rate was about 84 percent of capacity. In defense of the industry, R. S. Reynolds, president of Reynolds Aluminum Company points out that it is impossible to synchronize new plant construction precisely with anticipated demand increases, since plants must be large enough to be economic and they take several years to build.

It is entirely possible that growing demand will require nearly all of the industry's capacity some time in 1960. The aluminum industry characteristically declines more slowly, picks up much faster than the general economy.

During 1959, approximately 142,000 tons of new smelting capacity was added. Total productive capacity of the six United States producers at the end of 1959 stood at 2,336,000 tons yearly, compared to 1958 capacity of 2,184,250 tons. The bulk of the increased capacity is represented by two new pot lines totalling 72,500 tons installed at Kaiser Aluminum and Chemical Corporation's Ravenswood plant. Ormet completed a fifth pot line at its Hannibal works, adding another 36,000 tons. About the middle of 1959, Reynolds activated the first of three pot lines at the new Massena works, resulting in a further addition to total U. S. capacity of about 33,000 tons yearly.

In Canada, the Baie Comeau plant of Canadian British was completed and reached maximum planned capacity of 90,000 tons per year. Aluminum Company of Canada Ltd., the largest producer, added no new capacity during the year. Total

Canadian capacity now stands at 866,000 tons per year (90,000 tons Canadian British and 776,000 tons Alcan).

Alumina capacity in the United States now stands at 4,598,000 tons of refined product per year. A total of 642,500 tons of new alumina capacity is now in various stages of construction. Competition will increase total U. S. alumina refining capacity to 5,240,000 tons. Four of the U. S. primary producers operate alumina refining plants. Alcoa tops the industry with three plants and 1,695,000 tons of capacity and another 460,000 tons under construction. Kaiser has two plants, a total of 1,280,000 tons capacity, with no expansion underway. Reynolds has two plants, 1,277,500 tons of capacity and another 182,500 tons under construction. Ormet has one 345,000-ton plant with no immediate plans for future expansion.

All three of the largest U. S. producers made moves in the international field to participate in the anticipated growth in aluminum abroad. Kaiser joined with an Indian company to begin construction of an integrated facility capable of producing 20,000 tons of aluminum a year from Indian bauxite. Alcoa was planning a reduction plant in Mexico and moving ahead with plans to construct an aluminum smelter in Surinam. Reynolds and the British company, Tube Investments, Ltd., became joint owners of British Aluminium Company, Ltd., the only primary producers in the United Kingdom. The latter firm has an interest in bauxite mines, reduction plants, and fabricating plants throughout the world. Alcoa also teamed up with a Japanese fabricator, and in England with Imperial Chemical Industries.

Interest in development of African bauxite reserves increased enormously. Huge resources of bauxite on the west coast of Africa, perhaps the largest in the world, and many sources of potentially cheap power combine to make this area attractive for development. There are already seven projects involving 10 aluminum concerns and four governments. American companies are participants in four of these projects.

The outlook for aluminum is one of continually expanding markets, growing world-wide competition for the markets among world producers, and large scale growth in mining and producing facilities in Africa.



E. J. Bonkoff
General Research
Associates Ltd.
Toronto, Canada

ASBESTOS

"Some mines may encounter difficulty in filling many customers' orders promptly this year"

THE PAST RECORD: World demand and consumption of asbestos fiber during the post-war years expanded continuously until mid-1951. Production capacity was inadequate to satisfy the market during this period. In the late 1940's, as a result of the unprecedented post war demand, producers began expanding and adding to production facilities, developing new mines and mills, and new firms entered the industry.

A significant and continuous expansion in mine and mill production facilities got underway, which continued until 1958. Fiber producing capacity in Canada today is approximately

1,250,000 tons per annum.

It was in mid-1951 that the first real let-up in world demand occurred. Asbestos producers experienced their first post-war peak in demand in that year. This was the beginning of the post-war demand cycle for asbestos fiber.

THE CURRENT SITUATION: Canada, Southern Rhodesia, and Russia supply the bulk of world requirements for chrysotile asbestos fiber, the principal commercial form. Canada produces over one-half of the world's annual supply. Russia is estimated to produce about 25 percent, and Southern Rhodesia about 6

percent.

Demand continued to expand steadily throughout 1959. Exports from Canada increased 17 percent in 1959 over 1958, and value was up a similar percentage, to about \$105,000,000. Volume virtually equalled the all time record established in 1957.

The steady and steep increase in asbestos sales through 1959 was particularly evident in milled fibers. Exports from Canada in these groups increased 26 percent. Exports in waste, refuse and shorts increased only 11.7 percent. Producers experienced difficulty in supplying demand for these lower grades.

The problem in the supply-demand pattern is that asbestos deposits produce relatively fixed proportions of fiber lengths and quality. Against this constant is the current more rapid widening and expansion in the use and demand for the lower grades. The result has been a developing imbalance in demand for the grades produced.

Complete data is not available at this time, but it is clear that the strong world demand during 1959 should result in an increase in sales by other world suppliers.

The current high level of asbestos requirements must undoubtedly be forcing producers into near capacity production at this time.

PHYSICAL DEVELOPMENTS: Mine and mill developments continued during 1959, but without major addition to productive capacity.

One of the important developments was the decision by Canadian Johns-Manville Company to expand its open pit at Asbestos, Quebec. Within the next few years it is planned to supply mill feed entirely from open pit workings and close the underground mine. When fully developed, the pit is expected to be able to handle 30,000 tons of asbestos rock, and 12,000

tons of waste daily.

Advocate Mines Limited made significant progress in exploration and development of its property near Baie Verte on the Burlington Peninsula in Newfoundland. A testing plant is reported to have processed drill core and asbestos material from underground development workings. The fiber recovered was shipped to plants in the United States and Europe for further testing. Participating in the financing are the Canadian Johns-Manville Company, Amet Corporation Incorporated, Patino of Canada, and Financiere Belge de l'Asbest-Diment S.A., with Canadian Johns-Manville Company managing operations.

Cassiar Asbestos Corporation Limited recently increased the capacity of its mill in northern British Columbia by 50 percent to 1,500 tons daily.

An important mine and mill development is under way in the United States. Jefferson Lake Sulphur Corporation is building a 2,500-ton-per-day asbestos plant in California. Completion is scheduled for late 1960 or early 1961.

FORECAST FOR THE FUTURE: World demand for industrial raw materials, which includes asbestos, is strong, particularly in the United States and Europe. In Europe demand is extremely strong. Any production capacity not yet in use will undoubtedly be required almost immediately in the attempt by producers to satisfy 1960 market requirements. Some mines may encounter difficulty in filling customers' orders promptly this year.

The following is the salient statement for the future, based on careful economic research and market analysis: World demand and consumption of asbestos will shatter all previous records during the first six months of 1960. There is no doubt that 1960 will be a significantly better sales year for the asbestos industry than was 1959.



D. H. Hershberger
Treasurer
Brush Beryllium Company
Cleveland, Ohio

BERYLLIUM

"Dynamic Metals Corporation is developing flotation reagent for low-grade beryllium ores"

The beryllium industry's activity in a year is best measured by the quantity of beryl ore consumed. The number of pounds of beryllium obtained from each ton of ore varies according to the product and may range from 40 to 70 pounds.

In the year 1959 a new high was set in the number of tons of beryl ore consumed in the United States: an estimated 7,500 tons. This quantity was 25 percent greater than 1958's 6,002 tons. Of the total probably two-thirds was used for beryllium copper—the rest for pure beryllium, beryllium oxide, and miscellaneous products. To provide the raw material, 8,038 tons of beryl were imported during 1959 from sources shown in the accompanying table and about 350 tons were shipped by United States producers. Thus, total stocks of beryl in the country were increased by approximately 888 tons to a little more than 40,000 tons. This quantity includes government stock piles and industrial inventories.

Toward the long-hoped for objective of producing domestic beryllium ore concentrates an important step was taken in 1959. Atlas Corporation's Hidden Splendor Mining Company, Federal Uranium Company, and Radorock Resources, Inc. formed two subsidiary mining companies. The first: Dynamic Metals Corporation is developing a flotation reagent for low-grade beryllium ores. Early reports were optimistic about not only the technical achievement but the economic feasibility as well.

The other company, Beryllium Resources, Inc., was formed to locate deposits of beryllium containing minerals in North America and later to mine the suitable ones.

This company performed exploration work on the first discovery of a commercially economic phenacite deposit in the world at Mt. Washington in Nevada's Mt. Wheeler mining district. Phenacite is a beryllium silicate which looks like quartz and has a theoretical beryllium oxide content of 45 percent. While it has never been a raw material for beryllium production it is certain to be of interest to the extraction industry.

Furthermore, important new knowledge was gained of the geology of beryllium minerals.

Both Beryllium Resources, Inc. and Minerva Oil Company, Mineral Division have reported locations of bertrandite. This, also, is a beryllium silicate but differs by having water of crystallization in its formula.

Another mineral received attention. Helvite was found in interesting quantities in a large scheelite operation in Sweden. Investigation work on flotation of this mineral has commenced.

United States Receipts of Beryl In Short Tons By Countries of Origin for 1954, Through 1959

Country of Origin	1954	1955	1956	1957	1958	1959
Afghanistan	11	0	0	0	0	0
Argentina	0	441	2,330	1,545	772	2,480
Belgian Congo	11	128	992	222	1,188	395
Brazil	1,828	1,735	2,607	2,165	888	2,833
British East Africa	23	84	264	56	30	15
British Somaliland	0	9	29	0	0	0
British West Africa	0	0	22	0	0	0
French Morocco	0	0	26	0	0	0
Hong Kong	0	0	1	0	0	0
India	392	845	3,360	1,256	600	0
Republic of Korea	4	6	0	0	0	0
Madagascar	77	28	212	43	0	329
Mozambique	1,295	620	1,110	965	284	1,382
Nigeria	0	3	0	0	0	0
Norway	0	0	0	0	3	4
Pakistan	0	0	15	69	0	0
Portugal	338	283	242	33	0	77
Rhodesia & Nyasaland	957	861	559	266	135	151
Surinam	10	0	0	0	0	0
Sweden	5	0	0	0	0	41
Union of South Africa	865	994	602	670	699	331
TOTAL IMPORTS	5,816	6,037	12,371	7,290	4,599	8,038
United States of America	669	500	460	521	463	350
TOTAL SUPPLY	6,485	6,537	12,831	7,811	5,062	8,388

A great contribution to the mineral developments was the availability of an instrument to detect the presence of beryllium in any form. It is called a Beryllometer and is based upon a principle reported in Gaudin's report on a beryl picker. When beryllium is bombarded by gamma rays it emits neutrons. In the Beryllometer the gamma ray source is antimony 124. The instrument contains a scintillometer to detect the emission of neutrons by beryllium in the sample being tested. Although the Beryllometer is not readily and easily used by prospectors, it is an extremely valuable tool in the hands of an expert.

During 1959 the beryllium industry expended more than \$4,000,000 in expanding its plant facilities and equipment.

As an example of technical progress made in beryllium metal production, billets were forged to a diameter of 80 inches. These were machined to a diameter of 74 inches to be

used as heat absorbing discs in NASA's man-in-space program. Another step forward was made in producing extremely pure beryllium in tonnage quantities for special nuclear applications.

In addition to the increasing number of uses for pure beryllium and for its several alloys a successful new development was announced in 1959. A new class of intermetallic material, known as beryllides, was produced. Compounds of beryllium with metals such as tantalum and zirconium have extraordinary properties. They include high strength, oxidation resistance and high thermal conductivity at temperatures of 2,500° F to 3,500° F. Use of such material looks very promising.

For the year 1960 further expansion is planned by the industry and greater consumption of beryl ore is to be expected. The outlook for additional mineral supplies is now brighter than ever before.



R. T. Edgar
Vice President, Production Department United States Borax and Chemical Corporation Los Angeles, California

BORAX

"The world continues to look to the United States for supplies of boron products"

Less than 100 years ago the domestic borax industry concluded its initial year's operation with a total production of approximately 12 tons. That was in 1864, eight years after Dr. John Veatch discovered borax crystals north of San Francisco, California.

For 1959 the industry estimates that total production will closely approximate 1,000,000 tons—a marked increase over the previous year. This estimated tonnage follows a pattern of continuously increased production. The United States production of borates in terms of tons of boron trioxide, according to the U.S. Bureau of Mines, increased more than tenfold in the 30 years ended 1955; almost trebled in the last 20 of such years; and more than doubled in the last 10 years in that period. Notable gains have been similarly recorded for the four years that followed, including 1959.

The reason for this material growth stems principally from the fact that over the years more than 100 essential industrial and agricultural uses for borates have been discovered. The industry's ability and willingness to lower prices as technology advanced stimulated the development of new uses. Prices today are but a small fraction of those prevailing in the early years. As the demand for products containing borates increased there was also a corresponding rise in the production of borates, with the glass and porcelain industries taking the largest tonnages. Since 1926 California has been the world's principal source of supply. In that year production commenced at Boron, at the then newly discovered sodium borate deposit of United States Borax & Chemical Corporation—the world's richest and largest. Also in 1926 American Potash & Chemical Corporation perfected its process for the economic recovery of borax and potash from the brines of Searles Lake, California. This combination of events placed the United States at the forefront of the world's producers, which position it continues to occupy. United States Borax & Chemical Corporation is by far the largest domestic producer. American Potash & Chemical, and Stauffer Chemical Company follow in the order named. Some production occurs in Russia, Turkey, The Argentine, Chile, Italy, and Tibet. Production figures for Russia are not published but it is believed that Russia and Turkey are today the two largest of the foreign producers, although total foreign output remains a fraction of domestic production.

New outlets for borates in 1959 developed in the automotive, agricultural, and chemical industries. In the automotive industry an organo-sodium borate (LIQUIBOR) was introduced for use in hydraulic brake fluids in many of the 1960 car models to provide lower volatility and built-in corrosive protection. In the agricultural field a new product consisting of a combination of borax and trichlorobenzoic acid (BENZABOR) was launched and is showing considerable promise in control of deep-rooted perennials. Of notable significance to the chemical industry was the introduction of sodium hexylene glycol monoborate which is an organic boron compound with unique

solubility in non-polar solvents up to 35 percent by weight in most cases. Introduced late in 1959, this new compound has been suggested for use both as a corrosion inhibitor and as a flame retardant in organic systems, and as an oil agglomerate dispersant.

In the field of nuclear energy, boron (the B¹⁰ isotope) continues to be used to protect personnel from the harmful effects of reactors. Boron has the unique facility of absorbing neutrons produced by nuclear reaction without the emission of harmful secondary gamma radiation. Another new organic borate is used in combination with paraffin for nuclear shielding. The elemental form of boron is being incorporated into polyethylene and rubber for this purpose. Ammonium pentaborate is used in a "poison" charge in atomic submarines. One of the first atomic submarines used a boric acid ester for neutron shielding purposes.

The fact that the borax industry has stepped up its research activities is an indication that producers are not confining their expectations for the future solely on a continuation of established uses. U. S. Borax is currently spending \$2,000,000 a year on research. American Potash is allocating a large part of its estimated \$2,500,000 annual research budget to boron chemistry, and Stauffer Chemical is believed to be spending a substantial portion of its research dollars (almost \$3,000,000 in 1958) for that purpose. Firms other than the basic producers who are making important research contributions to boron chemistry include Dow Chemical Company, Olin Mathieson, Callery, Metal Hydrides, Stauffer, Aerojet, The Norton Company, Carborundum Company, Cooper Metallurgical Associates, Borolite Corporation, General Chemical, and Harshaw Chemical.

Although the project for using boron fuels in manned aircraft was terminated in 1959, the Navy and the Air Force are still interested in boron-based rocket propellants. The three basic producers continue to direct research efforts under government contracts in the investigation of thermally stable inorganic polymers. U. S. Borax is concerned with a variety of boron-boron, boron-nitrogen and boron-oxygen backbone polymers while American Potash & Chemical and Stauffer Chemical are continuing along similar lines with boron-phosphorus polymers.

Barring further strikes in key industries, 1960 is viewed quite optimistically by domestic producers. This optimism is based on sales predictions of a continuing demand for borates and on the hopes that the already proven versatility of boron chemicals will result in additional new products to join the formidable array of chemical, agricultural, atomic, and household uses for borax. With the conversion of mining at Boron to an open pit operation and with the completion of enlarged manufacturing facilities, the borax industry in the United States faces the future with confidence. Whatever the demands for borax products may be, the industry's ability to supply today and to expand for tomorrow has never been greater nor more flexible.

COBALT

"A number of new uses—low expansion alloys and catalysts were developed"

By Messrs. Rolling and Dumont
Metallurgists, Centre D'Information du Cobalt
Brussels, Belgium

The world cobalt production attained an all-time record in 1959 with an estimated 17,600 short tons, compared with 14,750 in 1958. The Belgian Congo, Northern Rhodesia, Germany, and Morocco greatly increased their production, while the Canadian output remained at the 1958 level despite a strike at the International Nickel Company of Canada Limited. Production decreased somewhat in the United States due to smaller cobalt recovery at the Calera mine. This reduction will be largely offset in 1960 by the anticipated output of Freeport Nickel Company's refinery at Port Nickel, Louisiana. Table I lists the production figures available.

A number of new uses were developed: low-expansion alloys, spring alloys, and catalysts.

HEAT-RESISTANT ALLOYS: The International Nickel Company introduced a new cast nickel alloy for high temperature applications. "Inconel 717C" is similar to "Inconel 713C" except for an additional 8 percent cobalt. Test results indicate a substantial improvement in creep-rupture strength without sacrifice of oxidation resistance, thermal fatigue resistance, castability, or ductility. The main application is as turbine blades for operation at 1,800° F.

Superalloy K-42B (22 percent Co) was selected for the high-temperature blading of a new super pressure steam turbine developed by Westinghouse Electric Corporation. Jessop's alloy G-18B (10 percent Co) was chosen as valve material for the high-pressure, high-temperature steam generator designed for Philadelphia Electric Company. In a material survey made by Standard Pressed Steel Company, Udimet 500 proved to be the most suitable alloy for use as bolts at 1,600° F.

In a series of tests conducted in several metallurgical plants, Union Minière du Haut Katanga's new alloy Umco-50 was being evaluated for its resistance to abrasion and corrosion at elevated temperatures.

OTHER METALLIC APPLICATIONS: Cobalt-bearing alloys are finding increased use as spring materials in corrosive and high-temperature environments.

Kovar, an iron-nickel-cobalt alloy, was developed a number of years ago for metal-to-glass sealing in the electronic industries. Today, it is used for the mounting of Pyroceram radomes to the metal body of guided missiles, as a base for clad metals in semiconductor applications, and as a backup for tungsten carbide drawing dies. Kovar is associated to a Mn-Cu-Ni high-expansion alloy in the modern thermostatic bimetals which can be used up to 840° F.

CATALYSTS: Cobalt molybdate and the recently introduced cobalt carbonyl compounds are finding increased application as catalysts for hydrogenation desulfurization, and oxo reactions, while cobalt oxides are being tested for use in catalytic afterburners promoting the oxidation of carbon monoxide and hydrocarbons in automobile exhaust gases.

TABLE NO. I
World Cobalt Production¹

Countries	1956	1957	1958	1959
Belgian Congo	10,019	8,945 ^a	7,166 ^a	9,374
Northern Rhodesia	1,207	1,566	1,677	2,372
Germany	1,031	1,082	1,219	1,620
Canada	1,769	2,253	1,610	1,505
Morocco	716	466	1,021	1,391
United States	1,554	1,649	2,009	1,300 ^a
Others	4 ^a	89 ^a	48 ^a	38 ^a
Total	16,300	16,050	14,750	17,600

1. In Short Tons of Contained Cobalt. 2. Revised. 3. Estimated.

RESEARCH: The U.S. Bureau of Mines has started a research program covering the following items: Development of processes for the separation of nickel and cobalt; Preparation of high-purity cobalt from laterite ores, using a solvent extraction process for the separation of nickel and cobalt; Recovery of nickel and cobalt from scrap materials.

The United States government currently sponsors a large number of investigations concerning high-temperature materials and other technological problems, whereas the research studies sponsored by the Cobalt Information Center are of a more fundamental nature.

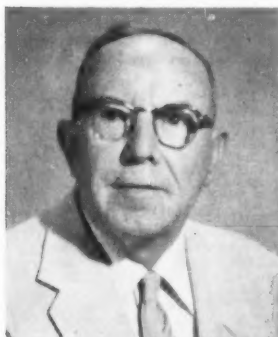
Studies on the Fe-Cr-Co-C quaternary diagram, on non-metallic dispersions in cobalt alloys, on the magnetic behavior to thin films and single crystals, on the effect of cobalt in the order-disorder phenomena and on its diffusion into various metals are being carried out in the laboratories of several universities and research institutes.

The data resulting from these investigations, and information gathered from more than 100 technical journals are reported in the quarterly review "Cobalt" which is published in Brussels, Belgium.

A number of research studies on hand are related to semi-conducting compounds such as cobalt antimonides and cobalt silicide which are said to have as much as 15 percent efficiency in converting heat to electricity.

New methods for the quantitative analysis of cobalt have been developed recently, using complexometric and chromatographic techniques, while the U. S. Bureau of Mines is planning basic research on developing precise procedures for the analysis of cobalt-bearing materials.

The *Cobalt Monograph*, in press at year's end will present a comprehensive picture of the previously widely scattered data on the element, its alloys, and compounds. It is hoped that the ready availability of such information will further the interest raised by cobalt in research and industry.



Frank J. Tuck
Statistical Engineer, Arizona
Department of Mineral Resources, Phoenix,
Arizona

For the first seven months of 1959, United States copper production was at a new record annual rate of 1,143,000 tons, but a strike, which began August 10, closed most of the large copper producers. The result was that instead of attaining a record production only an estimated 830,435 tons were produced; a loss of 313,000 tons due to the strike.

The resulting shortage in supply was responsible for the price rising from 30 cents in July to 33 cents in December. The price

might well have gone higher, if imports from foreign countries had not done a tremendous job in filling the gap. The net imports of primary copper into the United States totaled more than 400,000 tons (an increase of over 300 percent over 1958, and the highest figure since the post-war peak of 558,677 excess tons imported in 1953).

According to U.S. Bureau of Mines and Copper Institute statistics, domestic mine production was 830,435 tons, compared

COPPER

"It seems safe to predict copper production
of 1,100,000 tons in the United States in 1960"

with 979,000 in 1958, while the rest of the Free World produced an estimated 2,400,000 tons compared with 2,180,000 in 1958. Adding an estimated production of 568,000 by the Communist-controlled countries, makes a total world mine production of 3,800,000 tons, as compared with 3,740,000 in 1958.

Refined stocks in the United States were placed at 22,000 tons at the end of 1959 as compared with 48,000 tons at the end of 1958. This U.S. Bureau of Mines' estimate differs from the Copper Institute estimate because the Institute includes as "refined" the metal "in the process of refining." The Copper Institute estimated refined stocks at the end of 1958 to be 80,722 tons and 64,763 tons at the end of 1959.

Excess of imports over exports of copper in 1959 were reported to be 54,000 tons of refined copper, and a grand total of 421,000 tons of crude and refined.

Reported consumption of copper in the United States in 1959 amounted to 1,440,000 tons, as compared with 1,251,000 in 1958. Copper Institute figures reported "Deliveries to Fabricators" to be 1,312,412 tons in 1959, as compared with 1,179,416 in 1958.

NEW DEVELOPMENTS IN PROGRESS AND IN PROSPECT: The American Smelting and Refining Company has spent five years on exploration work on its Mission Project—formerly called East Pima—located 13 miles southwest of Tucson, Arizona. Early in 1959, the company announced plans to spend \$43,500,000 in the next three years in developing an open-pit copper operation at this property which would include mining and milling facilities with a daily capacity of 15,000 tons of ore and an annual output of 45,000 tons of copper. Stripping of the 200 feet of gravel wash material overlying the copper deposit was begun by the company.

Inspiration Consolidated Copper Company reported that the McDonald Shaft head-frame at Christmas, Arizona is completed and shaft sinking started in late 1959. The planned production rate for this mine (starting in about three years) is 4,000 tons of ore daily or 18,000 tons of copper annually.

The first copper ore was produced at the Anaconda Company's El Salvador mine in Chile, during April. Initial output of copper from El Salvador is scheduled at 3,500 tons per month and will increase to more than 8,000 tons per month by July 1960.

Details of the third phase of its \$40,000,000 expansion program were released in June by the Ray Mines Division, Kennecott Copper Corporation. With the completion of new storage, transportation, and milling facilities early in 1960, the property will be able to produce 20,000 additional tons of copper annually.

Duval Sulphur and Potash Company's Esperanza open-pit copper mine and 12,000-tons-per-day mill in Pima County, Arizona began producing in March. Five million tons of overburden were removed before ore production began. Test drilling of this property began in May, 1955, and an estimated 50,000,000 tons of ore were indicated. The ore contains some 15 pounds of copper in every tone of ore.

The big Toquepala project of Southern Peru Copper Company, in Peru, started production late in 1959, with a capacity of 120,000 tons of copper per year.

Bear Creek Mining Company (subsidiary of Kennecott Copper) has been actively exploring for copper for the past three years on a large group of claims near Safford, Arizona. The claims were purchased for \$4,000,000. It was reported that an extensive diamond drilling program indicated a large low-grade

copper deposit of mixed oxide and sulphide minerals. American Metal Climax, Inc., and Phelps Dodge Corporation were also reported to have been drilling large areas in the Safford district.

Transarizona Resources, Inc. started stripping operations to develop its open-pit copper mine 28 miles south of Casa Grande, Arizona. Transarizona's mill, utilizing the segregation process for treating oxidized and mixed oxide-sulphide copper ores (which uses heat and then flotation for the recovery of copper) will be the first commercial plant of this type in the United States. It was reported in December that the White Pine Copper Company had found another large copper deposit on company property in Michigan's upper peninsula. The firm will explore via shaft to determine the extent of the ore.

Plans were announced by Phelps Dodge for a \$5,000,000 expansion of the Lavender pit at Bisbee, Arizona.

COPPER STRIKES IN 1959: In March, 1959, work stoppages interrupted operations at a number of properties. The Ray, Arizona smelter of Kennecott was closed from March 2 until March 19; Kennecott's El Teniente mine in Chile from March 3 until March 6; the railroad lines between the Anaconda Company's mine in Butte and smelter in Anaconda for 3 days beginning March 6; and the Tacoma plant of the American Smelting & Refining Company from March 13 until June 17.

On August 10th both the Mine-Mill Union and the Steel workers struck all of Kennecott's plants in the United States. On August 11, Magma at Superior, Arizona, and San Manuel Mining Company were struck. The mines and metallurgical works of the Anaconda Company were closed from mid-August through the end of the year by the Mine-Mill & Smelter Workers. The Bisbee, Morenci, and Douglas mines and plants of Phelps Dodge were struck on August 20th.

The strike at Kennecott's Braden mine in Chile, with a production capacity of 16,000 tons monthly, began on October 2 and ended on the 31st. The strike at the White Pine mine, in Michigan, with a 3,500-ton-monthly capacity continued from October 29th to year's end.

The Asarco plants started up during the week of December 14. Towards the end of December, the workers of Kennecott's Arizona, Nevada, and New Mexico properties, and San Manuel Mining Company in Arizona, began to return to work, after signing agreements calling for about 7.0 cents an hour increase for each of the first two years plus about 8.3 cents an hour fringe benefits over the two year period.

THE STATUS AND OUTLOOK FOR THE COPPER INDUSTRY: The United States copper industry is now equipped to produce 1,200,000 tons of copper per year. With the steel strike settled and the prospect of good general business conditions, it seems safe to predict copper production of 1,100,000 tons in 1960, with a prospect of good enough consumptive demand for the metal to warrant a price of 32 to 35 cents per pound. Under strike conditions, but with copper demand being supplied by foreign mines, the copper producers' price was 33 cents per pound, and custom smelters' price 35 cents.

With the trend of increasing copper production capacity in the United States, South America, and S. Africa, there has been evident a willingness on the part of the industry to adjust its productive rate to fit the consumptive demand, and thus avoid exaggerated swings in price. As the general trend of consumption is acknowledged by everybody in the industry to be upwards, there would seem to be a good chance of bringing production and consumption more nearly in balance.



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World production of diamonds during 1959 was at a lower level than the record-breaking 28,000,000 carats mined during the year 1958.

This decrease is entirely attributed to a cutback in production of the Belgian Congo, which produces a large percentage of crushing board. Most other producing countries either main-

tained their production at about the same level, or even increased their output, as was the case with South Africa and British Guiana.

No major discoveries of unknown deposits were reported during the year, except for two diamond placers, one in the Urals, and the other in the far Northwest of Yakutia, which

DIAMOND

"1959 was a most notable year as total world diamond sales surpassed all previous records"

were announced by the Soviet news Agency Tass. While organized production ceased in Australia, another country, Basutoland, a British Protectorate enclaved in the Union of South Africa, shows some promise to become a new source of diamonds. Stones recovered in Basutoland will be marketed by the Central Selling Organization, and prospecting operations will have the technical assistance of De Beers.

An outstanding event in the diamond industry and trade was recently announced by the Diamond Corporation. An exclusive agreement has been signed in London, England, whereby all the diamonds from Russian production that the Soviet authorities wish to export for marketing in the Western World will be purchased by the Corporation and sold through the Central Selling Organization of the De Beers group of companies. This arrangement removes the menace of dumping and insures the stability of world prices.

BELGIAN CONGO: This country remains the largest producer of diamonds (by weight, not in value) as its output represents 56.5 percent of all diamonds mined in the world during 1959. Total production amounts to 14,854,000 carats, which means a decrease of 1,819,000 carats compared to 1958.

Of this total, 14,200,000 carats were mined in the Bakwanga fields of the Societe Miniere Du Beceka, whose output is about 98 percent industrial diamond, mainly crushing board. The entire 1959 production has already been sold.

In July 1959 at Bakwanga the first section of the new central washing and concentrating plant, which will have a capacity of 600 tons of run-of-mine gravel per hour was opened. The virgin gravel is carried directly from the mines to the plant by a system of belt conveyors which has a length of nearly 2.0 miles. All operations are commanded from a central post, where a luminous electronic control board shows the circuits of gravel being treated. Television screens enable the officials to control the several points where concentrates or diamonds are still handled.

Since March 1959 the Bakwanga group of mines has been enclosed by a fence 11 miles long, which is guarded by a special constabulary, and security has been greatly improved. The diamond mines remained unaffected by the recent tribal disturbances in the Kasai Province.

At the Kasai alluvial fields, where mining operations are carried out by the Forminiere Company, production remained at approximately the same level; it amounted to 658,000 carats. This production contains a higher percentage of gemstones (about 30 percent).

UNION OF SOUTH AFRICA: According to the provisional figure, total production for 1959 was 2,838,332 carats, an increase of 136,082 carats over the preceding year.

The three pipe mines of De Beers Consolidated Mines at Kimberley, Cape Province (Wesselsfontein, Bultfontein, and Dutoitspan), that of Jagersfontein (Orange Free State), and that of the Premier (Transvaal) Diamond Mining Company, an associate of De Beers, account for the bulk of diamond production in the Union (about 82 percent). The remainder is produced by the state-operated alluvial fields at Alexander Bay, and by individual diamond diggers in the proclaimed fields of Transvaal and the Cape Province.

SOUTH WEST AFRICA: Production for the first six months of 1959 was 443,119 carats. Exports for the first nine months of 1959 were 697,750 carats for a value of £11,113,581. About 99 percent of the total is produced by Consolidated Diamond Mines of South West Africa; its production contains 98 percent gemstones, about one stone to the carat.

Besides C.D.M., which operates its concession on the south coast, a northern coastal concession is worked by Industrial Diamonds of South Africa, producing small industrial stones, while De Beers is operating a small concession in Kaokoveld.

Mine Production of Diamonds by Countries¹ in Metric Carats for 1957, 1958, and 1959

Country	1957	1958	1959 ²
Belgian Congo	15,646,722	16,673,467	14,854,156
Union of South Africa	2,578,975	2,702,230	2,838,332
South West Africa	996,965	904,973	930,459
Ghana (Gold Coast)	3,124,821	3,131,695	3,041,633 ³
Sierra Leone ³	863,202	1,468,398	1,294,068
Liberia ³	757,138	868,575	877,000 ³
Angola	864,371	1,001,236	1,015,687
Tanganyika	390,971	521,064	554,951 ³
French Equatorial Africa ..	109,200	105,000	100,000 ³
F.W.A. (Ivory Coast & Guinea)	300,000	281,300	300,000 ³
Brazil ³	250,000	250,000	300,000
Venezuela	122,598	90,004	94,985
British Guiana	29,036	33,090	62,328
Other producing countries ³	11,081	10,000	12,000
TOTALS	26,045,080	28,047,052	26,175,799

1. Excluding the U.S.S.R. 2. Estimated. 3. Exports.
It is estimated that more than 80% of these newly mined diamonds were of industrial quality.

ANGOLA: The Companhia de Diamantes de Angola (DIAMANG) holds exclusive diamond mining rights, and in 1959 produced 1,015,687 carats of diamonds, of which more than 50 percent were gemstones. This is some 14,000 carats more than in 1958, the increase being due to the unusual number of stones recovered during prospecting operations (13,000 carats).

FRENCH EQUATORIAL AFRICA (Oubangui): This country has now become the "Republic Centrafricaine", but remains in the French Community. Only the production of the first quarter is known: 21,220 carats. During 1959, 69,546 carats were exported to France, the remainder was sent to the United States.

FRENCH WEST AFRICA: The Ivory Coast remains in the French sphere of influence, whereas Guinea has become an independent republic since last September. In 1959 147,000 carats of diamonds were received in France from these former colonies.

GUINEA: A government diamond office was opened in March 1959 at Kankan. About 22 buying licenses have been delivered. The company Soguinex, an associate of Selection Trust, continues to ship its production to the Diamond Corporation, London.

IVORY COAST: It is reported that 100,000 carats were produced during the first six months of 1959. The opening of a diamond buying office at Abidjan was recently announced by the government; it would seem that several buying and export licenses have already been granted.

GHANA: According to the provisional export figure (3,000,000 carats) diamond production in 1959 was on a lower level than in 1958, the difference between the two figures being of the order of 90,000 carats.

During the first six months of 1959, the four European mining companies, the largest of which is Consolidated African Selection Trust, produced 724,518 carats, and the native diggers mined 909,533 carats. C.A.S.T. hopes that the second section of its Anincheche plant will be put into commission in July 1960. This company is planning to replace some of its obsolete mining plants by one large centralized modern plant.

SIERRA LEONE: Exports during the first half of 1959 were 697,526 carats valued at £4,213,079, of which 331,289 carats were mined by Sierra Leone Selection Trust, a subsidiary of C.A.S.T., and 336,236 carats by the native diggers. The value of diamond exports during 1959 exceeds £9,000,000.

In August 1959 a government diamond office was opened at Kenema; it is now the only licensed exporter of diamonds mined by the native diggers. The office is staffed by officials of Diamond Corporation Sierra Leone Limited, which delivers to it all diamonds bought in the field. Official purchases of alluvial diamonds in 1959 were valued at approximately £5,700,000. This does not include the production of Sierra Leone Selection Trust, which ships its output to London.

Although illicit diamond digging and smuggling remains a serious problem, it would seem that it is gradually decreasing. The governor of Sierra Leone, Sir Maurice Dorman, recently estimated that some £44,000,000 worth of diamonds had been smuggled out of the country since 1956.

LIBERIA: This country has some alluvial diamond fields but their production is thought to be small. Diamond exports consist mainly of stones smuggled over from Sierra Leone and Guinea. There are seven registered diamond buyers in Monrovia. The present duty on diamond exports from Liberia is 15 percent ad valorem. According to our estimate based on imports from Monrovia to Belgium and the United States, exports from Liberia during 1959 were about 877,000 carats (1958: 868,575 cts).

TANGANYIKA: Diamond exports in 1959 were 554,951 carats (1958: 515,453 carats). The William mine is now operated by De Beers, jointly with the Tanganyika government.

BRAZIL: A reasoned estimate of 1959 production is 300,000 carats. Owing to extensive diamond dealing and smuggling, no production figures are available, and official exports are insignificant.

VENEZUELA: At 94,985 carats, production was about 5,000 carats higher than in 1958.

BRITISH GUIANA: Production in 1959 was 62,328 carats, against 33,090 carats in 1958, an increase of 29,238 carats, or 88 per cent.

U.S.S.R.: No reasonable estimate can be made. The Russians never publish any figures, only percentages of progress made, which have no significance when their basis is missing. For example, the production for 1959 was reported to be 2.4 times higher than the 1958 production, which in its turn was 8.0 times higher than the production of 1956, which is unknown, but amounted to five times the annual production of the alluvial diamond fields of the Urals.



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FLUORSPAR

"United States reserves, 35 percent grade, increased from 29,000,000 tons in 1956 to 36,000,000 in 1959"

Consumption of fluorspar during 1959, as revealed by the U. S. Bureau of Mines' Mineral Industry Surveys for third calendar quarter, continued its reapproach to the all-time peak consumption figure obtaining in 1957 when it totalled 644,688 short tons, all grades. For the first nine months of 1959 consumption totalled 437,781 short tons, thus approximating some 550,000 short tons for the entire year, or 85 percent of 1957's record. Consumption fell in 1958 to 494,227 short tons, or 77 percent of 1957's figure.

While both producers and consumers welcomed the reassuring rise in consumption of fluorspar, the domestic producers' lot continued to become more depressed inasmuch the ratio of foreign imports to consumption continued to increase as is indicated in the table.

United States Production, Imports, and Consumption of Fluorspar, All Grades, in Short Tons for Years 1956 through 1959

Year	Domestic Production Tons	Domestic Production Percent	Imports-Consumption Tons	Imports-Consumption Percent	Consumption
1956	306,500	49.3	485,552	78.1	621,354
1957	322,600	50.0	631,367	97.9	644,688
1958	310,600	62.8	392,164	79.3	494,227
1959 ¹	138,392	31.6	394,102	90.0	437,781

1. Nine months, January through September.

Imports of fluorspar have been supplied principally by Mexico, Italy, and Spain, with Mexico ranking first.

In 1959 Public Law 733 (United States Stockpiling of certain critical and strategic materials), passed in 1956, temporarily aided domestic fluorspar producers to a measurable degree in maintaining a rate of production more or less profitable. With the purchase contracts for fluorspar, which was stockpiled, ex-

ecuted with the Government having been fulfilled by the end of 1958 or early in 1959, all of the domestic producers have since suffered economic hardship. The southern Illinois company virtually abandoned, early in 1959, all of its activities in Illinois and elsewhere as did many of the smaller operators.

Continued efforts are being made by the Independent Fluorspar Producers Associated to preserve a place in supplying domestic fluorspar to the consumers. In December 1959, a hearing before the United States Tariff Commission, under Section 322 of the Tariff Act of 1930, was held. Vigorous opposition to the efforts of domestic producers to secure some relief came from foreign producers and importers, aided strongly by domestic captive fluorspar producers-consumers.

According to testimony given in the hearing the United States reserves increased from 29,000,000 tons in 1956 to 36,000,000 in 1959, of an average of 35 percent CaF₂ content. Little prospecting for additional reserves is being done currently due to the depressed operations occasioned by foreign imports.

Domestic producers are seeking some form of protection, either tariff increase, quota, or possibly a combination, which would permit a market price of some \$53.00 to \$57.00 per net ton f.o.b. mill.

If some relief is not forthcoming to the independent domestic fluorspar industry in 1960, the foreign producers and importers, assisted by the captive producers-consumers, will have succeeded in impairing seriously an industry which but a few short years ago displayed some genuine importance for both peace and national emergency times. When, at some time in the future, the national economy needs for peace, or for emergency, requirements are forced to depend on this industry, even heroic measures may find it very difficult to restore it to some reasonable measure of economic health.

GOLD

"Soviet gold position continued to improve; United States declined"

The status of gold in the United States in 1959 can best be summarized by three short words, "Gold Not Wanted". While there were no signs painted on the bullion vaults of the largest banks, the Federal gold depositories, nor the closed mines of the Mother Lode or placers of the Kuskowin to this effect, nevertheless that was the true situation.

The great outpouring of gold started in 1958 from the United States continued with \$1,412,000,000 leaving in 1959, as all other countries recognized the value and importance of gold as a monetary base, a credit base, and as the world's most useful medium to purchase anything.

Within the United States the gold mining industry's present position—as a byproduct of base metal mining—was never more apparent. With the six month-long strike at major copper, lead, and zinc mines, mills, smelters, and refineries, gold production dropped to 1,597,575 ounces—the lowest peacetime production since 1892. This drop was more significant in view of the all-time record high production of the largest gold mine—Homestake Mining Company which produced 573,884 ounces.

Montana output from many small producers was up slightly from 26,003 ounces in 1958 to 26,790 in 1959. South Dakota output backed by Homestake's record was up to 574,000 ounces from 570,830 in 1958. Bald Mountain Mining Company, the state's second largest gold producer shut down in July so the Homestake record was all the more important.

Washington gold output increased as the Knob Hill Mines, Inc. continued production of high grade ore at its Knob Hill mine. This is now one of the nation's largest gold-silver producers.

Nevada's increase was all due to greater output of placer gold by Round Mountain Gold Dredging Corporation at Round Mountain. This operation, however, closed completely at year's end. State output was 110,500 ounces.

The base metal and copper strikes' impact on gold can be best appreciated by these reduced figures: those for 1958 in parentheses. Utah, 240,300 ounces (307,824); and Arizona, 125,600 (142,979).

California's gold industry was reduced to two lode mines in Sierra County, and four connected bucket line dredges. Several small miners made other shipments and some production was made as a copper and lead byproduct. Total output was lowest since 1944.

It was a far different story outside the United States.

The Union of South Africa made an all-time record production of 20,065,515 ounces compared with 17,656,447 in 1958. Further annual increases are predicted, but not at such a record rate. The new and deeper mines in the Orange Free State and western Witwatersrand will more than offset the loss from the nearly depleted older mines of the central Rand.

In Canada there were 54 straight lode gold mines in operation during the year. In 1958 the Dominion government again reaffirmed the importance of the industry by extending and expanding, by 25 percent, the cost assistance payments under the Emergency Gold Mining Assistance Act. The act is good through 1960, as passed.

From all exports the Russian gold position increased with an estimated stock valued at \$9,000,000,000. The importance

of this stock is the fact that it is not pledged or mortgaged and is immediately available for currency or foreign purchases. It is not surprising then that Russian sales of gold were up sharply to about \$250,000,000, mostly in London. Based on estimated mine production valued at \$700,000,000 this left a net gain in gold stocks of \$450,000,000. In comparison South Africa's production was officially valued at £250,136,128 (\$704,000,000).

Thus the Soviet's gold position continued to improve in com-

parison to that of the United States which declined.

It is not inconceivable that the Russian policy may be to make the Ruble the most important International currency unit and back it with immediate convertibility to gold. Russia has an important start because of the declining position of gold in the United States.

It will take a drastic reversal of the official position of the United States Treasury to even halt, let alone reverse, this trend.



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"There was a revival of interest in magnetic roasting to reduce hematite to magnetite"

The longest strike in the history of the United States iron and steel industry crippled production of iron ore more than it did that of steel. Producers in the Lake Superior region, historically the backbone of the industry, had their worst year since 1939. The 116-day work stoppage by the United Steel Worker's union meant a loss of 50 per cent of the ore-shipping season; when the strike ended some of the mines and plants did not start up again because of cold weather.

On the other hand, imports of foreign ores continued at high levels and foreign-made steel came to United States markets in increasing amounts. Thus the strike gave foreign competitors an opportunity to encroach further on domestic markets and to increase the competitive pressures on these industries. These pressures emphasize all too clearly what our iron ore industry faces.

To reverse these trends in iron ore and steel is going to require the full cooperation of labor, management, and government. Labor leaders must open their eyes to the fact that wage increases without a corresponding increase in productivity per man hour inevitably bring higher prices, and when higher prices appear we lose a little more of our economy to well planned and organized foreign competition. The average working man must begin to understand the need for management to set aside a portion of profits for continuing research that will assure the technological advances necessary to keep industry in a strong competitive position. Management must face up to the fact that a larger proportion of income must be spent for research if the necessary advances in technology are to be assured—two cents out of each sales dollar is not a large enough expenditure anymore, as many growing industries are expending ten cents of their sales dollars. Government must take a more realistic attitude towards taxation, plant depreciation and reserves depletion; these things must not be so restrictive as to give foreign producers a lopsided advantage.

Iron ore production got off to a good start in 1959 because of depletion of stock piles at some steel mills but also prompted by the possibility of a strike at mid-year. For the mines that did reopen after the strike, extremely cold weather during most of November hampered loading operations. A temporary thaw in December, however, permitted lake shipping to continue to the latest date in the history of Lake Superior ore movements and made December shipments the heaviest on record. All-rail shipments of taconite pellets began the latter part of December and were expected to continue throughout the winter months. For the entire season, the American Iron Ore Association reported receipts of 43,200,605 gross tons from United States mines in the Lake Superior region. Stocks on hand from all sources at the close of 1959 were reported to total 64,516,011 gross tons, 2 percent less than at the beginning of the year. Consumption of iron ore and agglomerates for the year totaled 94,398,015 gross tons, 5 percent more than in 1958.

Shipments of iron ore from Minnesota mines were the lowest on record in 20 years and were estimated by the United States Bureau of Mines to total 35,400,000 gross tons, a decrease of 17 percent from 1958. Taconite pellets made up 17 percent of the Minnesota shipments, a slight drop from the previous year. Erie Mining Company shipped about 3,500,000 million

gross tons as compared with 2,500,000 tons in 1958, but Reserve Mining Company shipped only 3,640,000 gross tons as compared with 4,900,000 in 1958.

Michigan iron mines shipped 7,475,000 gross tons in 1959, or 8 percent less than in 1958. Important new developments were the Groveland open-pit mine and beneficiating plant which went into production on the Menominee Range, and construction to double the size of the Humboldt plant on the Marquette Range. The Allis Chalmers grate-kiln unit being installed as a part of this expansion will have an annual capacity of 640,000 gross tons of pellets.

Canada moved forward in its plans to produce a larger part of the world's supply of iron ore. The Iron Ore Company of Canada achieved a new high record in shipments of 13,058,909 gross tons. Exploration at the Carol East deposit in the Wabush area indicated 400,000,000 million tons of concentrating ore averaging 35 to 40 percent iron. Low-Phos Ore Ltd. started production at Moose Mountain, Ontario; at full capacity, concentrate production will reach 550,000 gross tons a year. Quebec Cartier Mining Company pushed construction and development near Lac Jeannine in Quebec. Steep Rock Iron Mining Company doubled its shipments in 1959 and added a second gravity-washing plant. Oceanic Iron Ore, Ltd., was granted an operating license for two concessions in northern Quebec. Wabush Iron Company continued development at Wabush Lake in Labrador. One estimate of future Canadian production projected a total of 37,500,000 gross tons in 1965 of which 34,000,000 would be available for export.

Iron ore was in the news elsewhere in the world too. The Tata Iron and Steel Company of India opened a new mine at Joda, increasing iron ore production to 2,400,000 gross tons annually. As a result of geological prospecting in the past year, Communist China reported 600 new iron discoveries with reserves totalling 100,000,000 tons. A new iron deposit in the Nimba Range of Liberia was under development by the Liberian-American-Swedish Minerals Company. Bethlehem Steel Company (Canada) Ltd. joined with several European groups to explore the Mekambo iron district in the Republic of Gabon, West Africa.

The USSR reported iron ore production in 1958 of 88,800,000 tons and called for over 100,000,000 to meet 1959 steel production goals.

Research into iron ore technology was not generally affected by the strike; on the contrary, many laboratory studies and pilot plant operations were expanded. Interest continued high in the direct reduction of iron ores as evidenced by the increasing number of pilot plant operations; various processes were demonstrated in at least five pilot plants in the United States and Canada, and in three in Europe. The ability of some processes to reduce complex and low-grade ores suggested a wide range of applications. The world's largest direct reduction plant was under construction and partly in operation at Monterrey, Mexico with full production scheduled for 1960. The plant uses the HyL process to reduce iron ore by contact with hot, reformed natural gas in five batch-type reactors. A large Krupp-Renn plant was being built in Germany and a smaller one went into operation in Spain. Plans for two Strategic-Udy plants were announced; one will be a part of an integrated steel plant to be built at Clarkdale, Arizona to recover iron

IRON

from old copper smelter slag piles and convert it to semi-steel.

There was a revival of interest in magnetizing roasting to reduce hematite to magnetite for magnetic recovery. Laboratory scale studies were in progress in a number of places, and a pilot plant of new design was tested at the Mines Experimental Station of the University of Minnesota. A pilot plant operation in Australia utilized a tandem shaft furnace. The Domnarvet kiln in Sweden was operated successfully on many different hematite ores; it was rumored that some of these kilns

will be installed in Minnesota and Michigan soon.

One of the areas of greatest interest for research in 1959 was the agglomeration of iron ores. The rapid growth of sintering capacity at the blast furnace plants is a direct result of the success in increasing pig iron production from existing blast furnaces through the use of sinter, while reducing coke consumption. The many discussions of the merits of sinter, fluxed sinter, and pellets showed no general agreement as to the direction iron ore agglomeration eventually will take.



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LEAD

"Largest single consumer is the automobile industry; batteries, tetraethyl, and solders"

United States lead consumption in 1959 was 11 percent higher than in 1958, and producers' refined stocks dropped 86,607 tons, from 252,466 to 165,859. At first glance these figures are quite impressive and seem to indicate that this market is rapidly approaching a healthy balance. Further study, however, reduces cause for any great amount of optimism for lead for the near future.

Consumption in 1959 is estimated at 1,087,000 tons, compared to 986,387 in 1958, and 1,138,115 in 1957. While 1959 registered an increase of 100,613 over 1958, it fell short of the 1957 mark by 51,115 tons. It must be remembered that 1958 was a recession year.

United States production of refined lead in 1959 was 378,354 tons, compared to 520,193 tons in 1958. This reduction of 141,839 tons was due to a drop in domestic mine production, quota restrictions on ore imports, and a labor strike that affected a large segment of the industry. If 1959 production had been equal to that of 1958, refined lead stocks owned by producers would have registered a gain of 55,232 tons instead of a reduction of 86,607 tons.

In 1959, domestic mine production of lead was the lowest in 61 years. This, together with the absence of an improved price, seems to indicate that the quota system, instigated in October 1958, has not yet provided the domestic miner the protection which he needs, and which the government intended him to have.

Going into 1959, the lead quotation stood at 13¢ and it finished the year at 12¢. Ten changes occurred during the period, and the range was from 11¢ to 13¢ per pound. Two reductions of one-half cent each occurred in December, shortly after most of the struck lead smelters resumed operations.

It is apparent that quotas will not fully accomplish their intended aims as long as inventories remain at their present abnormal levels. The purpose of this restriction is to limit the intake of foreign ore and metal so that the domestic producer will have a more equitable proportion of the United States market. Some are of the opinion that the lead quota, now set

at 80 percent, should be reduced to a lesser figure until a proper balance is finally realized. Notwithstanding, the quota program has prevented unrestricted imports and in this respect has afforded some protection to the domestic miner.

While quotas have been employed in an effort to provide at least a temporary solution to our local problems, the International Lead-Zinc Study Group, sponsored by United Nations, continues to discuss long-range plans for a better balance at the world level. At its April, 1959 meeting, a number of countries reported voluntary marketing restrictions on the part of individual producers. At the January, 1960 meeting held in Geneva, Switzerland, it was announced that such voluntary curtailments were no longer needed in the case of zinc because that metal now appears to be approaching a fair balance. However, the position of lead was deemed less favorable, and it was agreed that the voluntary market restrictions on that metal should be continued at least through September.

The present research program aimed toward developing new uses for lead is sponsored and supported by the leading world lead producers. Several interesting projects are now in progress, and one of extreme promise is in the area of sound attenuation. In this connection some of the newer jet aircraft employ lead to handle their sound problem. This metal, in powdered form, is mixed with a plastic which is laid on a fabric. The cabin of the plane is then lined with this material and the lead particles reduce the engine noises in the passenger area.

Lead consumption in 1959 was substantially better than 1958 and the accompanying "Balance Sheet" shows that all of the main categories, with the exception of cable covering, contributed to the increase. A review of this list reveals that the largest single consumer of lead is the automotive industry, which accounts for storage batteries, tetraethyl lead, and a good share of solders.

The battery industry increased its use of lead by 46,275 tons in 1959, which was 14.7 percent over its 1958 consumption. It is interesting to note, however, that the estimated 359,000 tons of lead that went into batteries in 1959, was almost 8 percent less than was used for the same purpose in 1950, even though there was an increase of 43 percent in the number of automobiles in operation during the same period. Improvements in both battery design and the voltage regulator of automobile generators are responsible for this new trend. The average life of a battery has actually increased over 50 percent during the past decade.

Lead consumption improved 11 percent in 1959, and general economic factors alone justify an estimated increase for 1960 of at least 5 percent over 1959. On this basis, 1960 lead consumption will be about 1,140,000 tons. While this reflects a moderate improvement over the past two years, it is still only slightly better than the year 1957, when 1,138,115 tons were used.

It is quite evident that these relatively small increases alone will not immediately resolve the domestic mining situation, and that further effective regulatory measures might be required to accomplish that end. Any measures that are employed should assure an adequate supply of metal to United States consumers that will never subject them to hardships, as well as to provide the domestic producer with an equitable proportion of the lead market. The domestic lead industry will be in a comparatively healthy state when that balance is achieved.

Lead "Balance Sheet" in Tons of Metal

Consumption by Industries	1958	1959
Storage batteries	312,725	359,000
Tetraethyl lead	159,412	162,000
Cable covering	74,981	61,000
Construction	120,182	130,000
Pigments	95,901	112,000
Solder	59,553	66,000
Ammunition	40,215	45,000
All others	123,318	152,000
Total consumption	986,387	1,087,000
Supply		
Mine production	267,377	253,000
Secondary	401,787	435,000
Imported ores	202,101	126,000
Metal imports	368,452	218,000
	1,239,717	1,032,000
Less Exports	2,373	3,000
Surplus	250,957	(58,000)



J. Eldon Gilbert
General Manager
Cordero Mining Company
Palo Alto, California

MERCURY

"Domestic production promises to continue at about its present rate of 30,000 flasks"

During 1959 the mercury producing industry of the United States settled back to the normal operating position wherein the higher cost operators were suspending operations, the remainder were struggling to keep in the black—in this not all were successful—and general production was declining.

Whereas, during the past decade, the industry has been suffocated by a flood of low priced mercury; has been on an exhilarating price binge, when government manipulations diverted production from consumers; has played the chief character role in a cloak-and-dagger drama; has basked in the radiance of a government-support floor price, the year 1959 brought nothing more dramatic or romantic than slow starvation.

At the end of 1958, the purchase program of General Services Administration terminated and a sharp price break had been predicted. This price decline took place more gradually than had been expected. Producers had shipped all available metal to GSA and consumers found it difficult to get mercury at bargain prices. So depleted were the pipelines of supply, and with European producers reluctant to sell at a depressed price, a sharp price increase occurred which reached a peak of \$245 to \$249 in April. From then on to the end of the year, with consumers more comfortably stocked, the price continued to decline, reaching \$212 to \$214 by the year's end.

While the United States producers curtailed their production by 19 percent to 30,750 flasks, imports of 30,260 were nearly the same as the previous year when 30,936 were imported. With a consumption of 53,100 flasks, the total of production plus imports of 61,100 resulted in a surplus of nearly 8,000 flasks.

In Italy, where a large mercury stockpile had been accumulated and where increasing labor costs made the world price

appear less attractive, production was reduced from about 60,000 for 1958 to around 45,000 for 1959. During this period of reduced production, however, favorable surface and underground exploration was carried out.

Spanish production continued, probably near the rate it had been for the past several years, around 50,000 flasks. At the Almaden mine in Spain two new 100 metric tons furnaces are being installed by Pacific Foundry Company of San Francisco, California to double the capacity of the present furnaces. With the completion of the new furnace plants, expected in 1960, Spanish operators will be in a much better position to produce at a lower price or to furnace lower grade ore. The mines in northern Spain, near Oviedo, are continuing to improve their furnacing equipment and may, in 1960, install additional capacity.

Mexican production probably declined during the year to about 20,000 flasks. Much of this was sold in Europe, with only 3,630 coming to the United States.

Yugoslavia, where an additional ore discovery was reported and a new furnace is being erected on an already producing mine, continued its output of about 13,500 flasks.

In all probability, 1960 will show an upturn in the industry. With the market already so low that practically no domestic operators can make a profit, and with many of the foreign producers now being hurt by rising costs, any further reduction in price will drastically reduce production.

Domestic production promises to continue at about its present rate of 30,000 flasks. Consumption will probably be about 54,000—this leaves 24,000 flasks to be supplied by imports. Any more metal than this imported for consumption, i.e., not tied up in government stocks, will immediately depress the market.



John R. Bogert
Field Editor

MINOR METALS

"Development of foreign manganese and columbium deposits highlight the year."

ANTIMONY—No domestic stibnite was mined during 1959 although 664 tons of antimony was recovered from tetraedrite concentrates by the Sunshine Mining Company in the Coeur d'Alene district of Idaho. Imports of ores and concentrates during the year amounted to 13,300 tons, an increase of 34 percent over 1958—coming mostly from South Africa, Mexico and Bolivia.

Domestic consumption of primary antimony increased 17 percent over 1958 to 13,900 tons. Uses followed industrial activity in battery grids, anti-friction bearings, cable sheathings, type metals, paints, flame-retardant chemicals, etc. During the year 165 tons of antimony ore and concentrates were exported to India, and 9 tons of metal and alloys were shipped to the Netherlands, Venezuela, and Brazil.

General increases in imports, smelter production, and domestic consumption are anticipated for 1960.

BISMUTH—Imports for 1959 from Peru, Mexico, and Yugoslavia totaled 457,000 pounds, down 27 percent from 1958.

This was the smallest quantity of bismuth imported since 1948. The Cerro de Pasco Corporation continued as the leading world producer, accounting for more than 50 percent of United States imports.

Consumption of bismuth increased slightly over 1958 to total 1,254,000 pounds. This was used almost entirely in low-melting alloys, pharmaceuticals and industrial chemicals, and other alloys in that order. The price of \$2.25 per pound of metal remained constant throughout the year.

CADMIUM—Production of primary and secondary cadmium metal in the United States in 1959 amounted to 8,430,000 pounds, down 13 percent from 1958. Consumption amounted to approximately 11,000,000 pounds, up 39 percent from 1958. Dealers' stocks thus suffered a decline of over 2,000,000 pounds, being only 3,400,000 pounds at the end of the year. Total exports of cadmium metal and flue dust increased to approximately 900,000 pounds, up 55 percent from 1958.

Cadmium metal prices increased on October 1, 1959 from \$1.30 a pound to \$1.40 a pound on all lots up to one ton.

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CHROMIUM—Domestic production of chrome ore, entirely from the mine of the American Chrome Company, Nye, Montana, amounted to 105,407 short tons averaging approximately 39.0 percent Cr_2O_3 . This entire production was sold to the U. S. government on a contract basis. Imports of chrome ores, chiefly from the Union of South Africa, Rhodesia, Philippines, and Turkey, amounted to 1,526,444 short tons, up 21 percent from 1958. Due to the political situation imports from Cuba were negligible.

COLUMBIUM-TANTALUM—Production of concentrates in the United States was almost entirely confined to placer operations of the Porter Brothers Corporation, Bear Valley, Idaho. Output for the year was down to only a little over 100 tons

which was sold to the government. Imports during 1959 of columbium concentrates increased while imports of tantalum concentrates decreased over 1958.

The Molybdenum Corporation of America continued development of a large columbium deposit in Brazil which they expect to mine by open pit. Results to date show a large tonnage of ore averaging over 3.5 percent columbium oxide. The Kennecott Copper Corporation and the Molybdenum Corporation of America jointly continued development of a columbium prospect at Oka, Quebec. The General Electric Company opened a new Cyrogenics Laboratory to test, among other things, the strange behavior of columbium and tantalum at super cold temperatures.

MAGNESIUM—Production for 1959 was estimated to be about 55,000 tons, up about 25 percent from 1958. Most of this went to the die-casting market, for structural uses in aircraft and missiles, and alloyed with aluminum for consumer products. New production facilities were inaugurated when the Alabama Metallurgical Corporation opened its new plant in October with an annual capacity of 7,000 tons of pigs and ingots.

MANGANESE—Oversupply characterized the manganese market for 1959. Stockpiles were at a record high and prices were generally depressed throughout the year.

Domestic production of ore amounted to an estimated 208,000 tons. This is considerably less than the 323,108 tons produced in 1958 due principally to the end of government purchases in August. Imports were an estimated 2,250,000 tons plus 190,000 tons of ferromanganese, mostly from Brazil, Ghana, India, Mexico, and the Union of South Africa.

RARE EARTHS and THORIUM—Domestic shipments of monazite, bastnaesite, thorite, and xenotime concentrates totaled 1,878 tons valued at \$318,000. This is 143 tons less than was produced in 1958. The concentrate production contained a total of about 700 tons of rare earth oxides plus 100 tons of thorium.

Operations at the Mountain Pass, California, property of the Molybdenum Corporation of America continued at about one-third capacity during the year. The Aircraft Nuclear Propulsion Department of General Electric intensified research on rare earth minerals developing new metallurgical techniques and more applications for alloys using yttrium. Nuclear use of thorium was under active investigation by the Atomic Energy Commission and private firms. Operations for the recovery of thorium from waste liquor from the uranium processing plant at Elliot Lake, Blind River, Ontario, were begun by Rio Tinto Dow, Ltd.

TITANIUM—The titanium picture remained gloomy during 1959. Production of titanium sponge declined for the third year in a row to 3,898 tons—687 tons less than 1958. Consumption likewise slumped to 3,953 tons against 4,147 tons for 1958. This declining pattern has been the trend since the government cut back military purchases in 1957.

The Quebec Iron & Titanium Corporation operated its Sorel plant in Quebec at greatly reduced capacity during the year. The Mallory-Sharon firm of Niles, Ohio, owned by P. R. Mallory Company, Sharon Steel Company, and National Distillers Corporation, is now being managed by the Bridgeport Brass Company under a \$250,000 a year contract plus certain options.

MOLYBDENUM

"The United States gained one new byproduct producer—Duval Sulphur's Esperanza mine"



George O. Argall, Jr.
Editor

The molybdenum industry in 1959 was featured by strong demand and consumption in Europe, loss of important copper byproduct production by strikes in the United States, increased production outside the United States, continuing world-wide exploration search for unknown deposits, and extensive development of several large, but low grade deposits.

European demand was so high that United States exports (18,906,927 pounds) during the year (58 percent higher than 1958) absorbed a large part of the steel industry's normal con-

sumption which, however, was not used because of the steel strike.

Byproduct production from open-pit copper ores was down 9.0 percent because of the copper strike. Molybdenum mine production, as contrasted to byproduct, was up 43 percent over 1958. This is reflected in Climax Molybdenum Company's increase in tonnage mined and milled which was 9,091,544 in 1959 and only 6,363,620 in 1958.

All operations at Climax were placed on a seven-day produc-

**Mine Production of Molybdenum in Pounds by Countries
For 1955, 1956, 1957, 1958, and 1959**

Country	1955	1956	1957	1958	1959
Canada	774,000	871,000	783,739	888,264	850,000
Chile	2,817,000	3,121,000	3,100,000	2,972,000	3,500,000*
Japan	439,000	534,000	594,000	683,000	825,000
Republic of Korea	24,000	31,000	34,000	82,000	41,800*
Mexico	55,000	35,000	40,000*	57,000	50,000*
Norway	379,000	365,000	365,000	481,000	521,000
United States	61,781,000	57,462,000	60,753,000	41,069,000	50,345,000
Yugoslavia	948,000	800,000*	462,000*	400,000*	450,000*
Philippine Islands	0	0	0	0	59,100
Russia	—	—	—	9,300,000*	10,000,000*
Others	683,000	982,000	400,000*	100,000*	100,000*
Total	67,900,000	63,200,000	66,613,000	55,958,464	66,741,900

*Estimated.

tion week in August and remained until year's end. In the mine, development centered on the new underground No. 4 shaft to develop a production and ventilation level 300 feet below Storke level and an exploration level 300 feet deeper. A new tailing pond was completed at Robinson which will serve until the year 2000. Elaborate measures have been taken to reclaim and reuse water from this pond for milling.

San Manuel Copper Company produced 1,435,613 pounds of molybdenite from milling 7,595,867 tons of copper ore. The 1958 figures were 1,872,450 pounds from 11,486,300 tons.

Phelps Dodge Corporation's Morenci mine produced 694 tons of concentrate, 725 in 1958, from a much lower tonnage of copper ore mined because of the strike.

Inspiration Consolidated Copper Company produced a record amount—380,347 pounds—at its Inspiration mine.

The United States gained one new copper byproduct producer—Duval Sulphur and Potash Company's Esperanza mine in Arizona, and lost another as Miami Copper Company closed its flotation mill.

Other byproducts were: American Smelting and Refining Company, Silver Bill; Bagdad Copper Company, Bagdad; Kennecott Copper Corporation's Utah, Chino, and Nevada mines divisions; and Union Carbide Nuclear Company from its Pine Creek tungsten-copper ore.

Climax Molybdenum carried out diamond drilling southeast of its Climax mine and reportedly found a separate but much smaller ore body. The company drilled at Red Mountain about 35 miles from the Climax mine. An encouraging exploration program was also carried on in Montana.

Molybdenum Corporation of America maintained a vigorous exploration program at its mine at Questa, New Mexico. This work has indicated mineralization in a one-square-mile-area to a depth of 800 feet. The most favorable area contains about 0.50 percent MoS₂ over widths of about 500 feet. Exploration is continuing.

An Alaskan prospector announced discovery of what apparently is a major molybdenite outcrop 80 miles northwest of

Anchorage. Further work is planned for the summer of 1960.

Kennecott Copper Corporation was again the world's second largest producer with output of 20,967,000 pounds of molybdenite concentrates (23,626,000 in 1958). Production from the Braden mine in Chile was up, while output of Utah Copper, Nevada, and Chino divisions was cut by copper strikes.

Exploration for molybdenum in Canada continued at a rapid rate. The most promising results were at Boss Mountain, British Columbia, where American Metal Climax, Inc. has developed several millions of tons of ore grade reserves by several seasons of diamond drilling. Further drilling is scheduled. Also in British Columbia, Heustis Molybdenum Corporation explored near Terrace, and Kennco Explorations (Kennecott Copper Corporation) optioned molybdenite prospects in the Alice Arm district.

The sole producer was Molybdenite Corporation of Canada Limited's Lacorne mine northwest of Val d'Or, Quebec. The company operates an underground mine which is being deepened to 1,000 foot level, a flotation mill, and a roasting plant to convert molybdenite to technical-grade molybdenic oxide.

Exploration in eastern Canada was carried on by the N. V. Billiton Company, Lindsay Explorations Limited, Jonsmith Mines Limited, Nortoba Mines Limited, and International Ranwick Limited. None of these companies reported discovery of ore bodies, however.

In Sierra Leone encouraging surface prospecting and diamond drilling in the Lake Sonfon district indicated possibilities of a molybdenum-lead ore body. Further drilling is planned. While molybdenite had been known in the area for many years a geochemical survey pin-pointed the area to drill. An additional 150 square miles is to be prospected by geochemical methods seeking other occurrences.

The molybdenite deposit in northeastern Greenland which attracted much interest several years ago has been proven to be too low grade for mining in this remote area because of climatic and transportation difficulties.

While much publicity resulted from discovery of a large deposit of molybdenite in northern Sardinia during the year, sampling, however, proved the disseminated mineralization to be below ore grade.

The Republic of the Philippines joined the list of molybdenum producing countries as 59,100 pounds were produced by Sipalay Copper Mining Company as a copper byproduct.

An extensive deposit was reported to have been discovered in the State of Jalisco, Mexico. An outcrop 1,500 feet long was reported with 50,000 tons of 2.5 percent ore indicated.

The demand in 1960 looks encouraging and all indications point to a closely balanced demand and supply position. Exploration must continue to seek new mines in order that forecasted demands in the years ahead can be met. While there is no shortage of reserves in the United States there are limitations on ability for the largest producers to quickly expand output. Development of a new major mine would give greater market flexibility.



Dr. John F. Thompson
Chairman of the Board
International Nickel
Company of Canada,
Limited
Copper Cliff, Ontario,
Canada

NICKEL

"The year saw one of the sharpest and swiftest recoveries in demand for nickel in history"

Free world consumption of nickel in 1959 exceeded 400,000,000 pounds, or about 25 percent over the 320,000,000 pounds consumed in the previous year.

Despite the prolonged steel strike in the United States, nickel consumption in 1959 registered an increase of about 35 percent over 1958. Marked gains in nickel consumption were also recorded in the United Kingdom and other European markets. The United States, as in the past, was again the world's largest consumer of nickel. The year saw one of the sharpest and swiftest recoveries in demand for nickel in history.

Free world capacity for nickel production in 1959 was at an annual rate of about 550,000,000 pounds from all sources. This capacity, based on presently planned programs, is expected to increase by more than 100,000,000 pounds, at 18 percent, in the next two years. During the latter part of 1959 the changed political situation in Cuba introduced an element

of confusion in that country's nickel industry which has not been entirely resolved and the forecast for increased capacity is made with this fact in mind. International Nickel's new mining project at Thompson, Manitoba, will contribute 75,000,000 pounds to this annual increase in capacity. The Thompson project takes on added significance in light of the current situation in Cuba.

Canada continues to be by far the largest supplier of nickel to the United States, the United Kingdom and other Free World markets. Of the Free World's present operating capacity for nickel production, Canada accounts for over 70 percent; Cuba, 10 percent; United States, 4 percent; and New Caledonia, Japan and other sources, the remainder.

During September, the General Services Administration of the United States government announced that it would offer for sale its Nicaro nickel plant in Cuba, and would receive

purchase proposals up to December 1, 1959. The GSA said the plant is capable of producing nickel at an annual rate in excess of 50,000,000 pounds (metal content) in the form of nickel oxide powder and sinter. Early in December, it announced that it had received responses from private industry and that an interest in acquiring the plant had been expressed by the Cuban government. The GSA said that a considerable period of time may be required to determine whether a sale acceptable to the United States government can be concluded. Also in Cuba, the Freeport Nickel Company continued mine development and plant erection at Moa Bay to produce a nickel concentrate slurry for shipment to Louisiana for refining.

The development of the new mining project of International Nickel at Thompson, Manitoba, proceeded on schedule. It is expected to come into full production in 1961 at an annual rate of 75,000,000 pounds of nickel and will constitute the biggest nickel-producing operation in the world next to International Nickel's operations in the Sudbury district of Ontario.



G. Donald Emigh
Director of Mining
Monsanto Chemical Co.
St. Louis, Missouri

Phosphate rock is both concentrates and ore used direct. Tons are long tons. The 1958 figures are U.S. Bureau of Mines' although they differ in some cases from the writer's.

United States production in 1959 was about 16,400,000 tons of which 2,800,000 were exported. This is an increase of 10 percent over 1958 accounted for by recovery from the 1958 recession and by continued growth. About two-thirds of 1959 production consumed by domestic industry went directly into fertilizer, the other one-third into electric furnaces. Increased production over 1958 was spread over the three producing areas; Florida, Tennessee, and the West.

World production for 1959 was about 37,400,000 tons, versus 34,900,000 tons in 1958. New mining operations started production in Togo and Senegal, West Africa. Other new developments are reported from South Africa. Increased tonnages will come from Israel and from Jordan where the Development Loan Fund in Washington, D. C. has granted a loan of \$1,500,000 for mine improvement. Together with increased production, new areas of consumption are developing of which mainland China and India are the principal examples.

Production from the three United States fields (1958 figures in parenthesis) follows: Florida, 11,400,000 tons (10,900,000); Tennessee, 2,300,000 tons (2,000,000); and West 2,700,000 tons (2,200,000). There was some relatively slight continued interest in North Carolina and possibly South Carolina; however, the three main fields continue to receive nearly all the serious attention.

FLORIDA: About 99 percent of production was by eight companies in the pebble field (near Tampa) and most of the remainder by one producing company in the hard rock field north of Tampa. Nearly all pebble-rock producers announced triple superphosphate production expansion either by new or by addition to existing plants. For the most part these companies continued active in expanding reserves. A brief summary of the nine Florida producers is as follows:

American Agricultural Chemical Company operated its Boyette and South Pierce mines, and fertilizer and electric furnace facilities near Pierce. Plans are made to build a new washer in Polk County.

American Cyanamid operated the Sydney and Orange Park mines and its fertilizer plant at Brewster.

Armour Fertilizer Works operated its mine and fertilizer plant near Bartow. Recent reserve acquisitions in the city limits of Bartow will be mined under arrangements providing for rehabilitation of mined areas.

Coronet Phosphate Company, a division of Smith-Douglass Company, operated in the Tenoroc mine and a defluorinating plant at Coronet.

Davison Chemical Company, a division of W. R. Grace &

The world's second largest producer—Falconbridge Nickel Mines, Ltd.—operated its Canadian mines and smelter at capacity of about 60,000,000 pounds in 1959. The company continued exploration for lateritic ores in the Dominican Republic and plans a pilot plant there.

Japan's nickel refining companies continued to furnace imported New Caledonia lateritic ores.

Societe Le Nickel completed expansion at its New Caledonian plants and reportedly plans additional facilities.

Russian production, largely from the Petsamo district in what was formerly part of Finland totalled about 115,000,000 pounds. Russia was a large buyer of nickel alloys and fabricated parts during the year, particularly in Europe, but would buy wherever obtainable.

Hanna Mining Company, the only United States producer, maintained normal operations furnacing blended grade ores for maximum economic long range output. The company uses the Perrin electrothermic process to treat nickel silicates.

PHOSPHATE

"Nearly all Florida pebble rock producers announced triple superphosphate production expansion plans"

Company, operated the Pauway and Bonny mines. The latter is being expanded to take over production of Pauway which will shut down about mid-1960. Construction started on a di-ammonium phosphate plant to be operated with the present triple superphosphate facilities.

International Minerals and Chemical Corporation operated its Noralyn and Achan mines. Noralyn changed to a larger (18-inch) transportation pipe line from mine to washer. Operations continued at the Bonnie chemical-fertilizer plant.

Swift & Company operated the Varn and Watson mines and fertilizer plant.

Virginia-Carolina Chemical Corp. operated the Homeland and Clear Springs mines. The Phosmico flotation plant exhausted locally stored feed at year's end so expanded flotation facilities are going in at Clear Springs. Expansion was started at the Nichols triple superphosphate plant and production will be tripled. A 2½ months strike shut down the fertilizer plant and the Homeland mine in mid-1959.

In the hard-rock field, Kibler-Camp operated its mine near Dunnellon. T. V. A. continued its search for reserves in this field. Victor Chemical Works operated its furnace plant at Tarpon Springs.

TENNESSEE: About 90 percent of the Tennessee rock is used in electric furnaces. Mining was entirely on brown rock.

Hooker Chemical Company mined and operated its furnace plant at Mount Pleasant. The company merged with Stauffer Chemical Company and is now a division of Stauffer.

T.V.A. mined at Godwin and processed the ore in its electric furnace at Florence, Alabama.

Monsanto Chemical Company operated its electric furnace and mining operations at Monsanto.

International Minerals and Chemical Corporation mined near Wales and the plant produced rock for direct soil application as well as defluorinated rock.

Virginia-Carolina Chemical Corporation mined near Mount Pleasant and produced rock for fertilizer.

Armour Fertilizer Works mined and produced fertilizer rock near Columbia. Several small firms produced ground rock.

WEST: 70 percent of western production of rock is from Idaho. About 80 percent of western rock is used in electric furnaces. All mine production in Idaho and Wyoming is open pit; all production in Montana and Utah is underground. Major new developments involve Bunker Hill Company, Central Farmers Fertilizer Company and J. R. Simplot Company.

Bunker Hill changed its plans to build a triple superphosphate fertilizer plant and began construction of a wet phosphoric acid plant at Kellogg, Idaho, to be on-stream in 1960. The company continued development work on its property near Ellston, Montana.

Central Farmers Fertilizer Company started its electric furnace-fertilizer plant near Georgetown, Idaho, in mid-1959 and mined nearby. This is the first Cooperative mining phosphate rock in the United States.

Montana Phosphate Products Company mined phosphate rock underground for fertilizer use. Operations are near Garrison, Montana. George Relyea mined underground in the same area.

Victor Chemical Works (See Tennessee) operated its electric-furnace plant at Silver Bow, Montana and mined underground 30 miles to the south.

J. R. Simplot Company operated the Gay mine near Pocatello, Idaho with production going both to its own fertilizer plant near Pocatello and to Westvaco Chemical Division's electric-furnace plant near Pocatello. The company installed sulfuric acid producing facilities at the Pocatello plant utilizing Wyom-

ing sulfur. The company's Centennial mine, on the Idaho-Montana border, was not operated. The company took over under long-term lease the Conda mine of The Anaconda Company near Soda Springs and mined and operated beneficiation facilities at that point.

Monsanto Chemical Company operated its electric furnace plant at Soda Springs, Idaho, and mined its Ballard property. A new 12-mile private haul road was placed in operation.

San Francisco Chemical Company operated its open pit mine near Leife, Wyoming, and its underground mine a few miles north in Utah. Ore from both places was beneficiated in the new plant at Leife. The company, which is affiliated with Stauffer Chemical Company, purchased the Humphreys phosphate property near Vernal, Utah. Stauffer has stated its intention of building an electric furnace plant at this location.

PLATINUM

"Major feature was the sharp drop in platinum exports by Russia"

After several years of rather violent fluctuations, the platinum industry in 1959 was characterized by a condition of reasonable balance between supply and demand. Superimposed on this were clear indications of a steady growth in demand from a number of consuming industries, with every expectation that the present year will see further modest increases in output.

Consumption in the United States alone is estimated at a little over 300,000 ounces against 265,000 in 1958, with the outlook for 1960 promising still further increase.

The major feature of 1959 was the sharp drop in exports of platinum metal by Russia that became apparent in the early part of the year. After shipping something like 200,000 ounces troy in 1958, with prices being cut rapidly, the USSR authorities, for reasons that naturally can only be guessed at, withdrew almost entirely from the market, leaving the western producers with a temporarily inflated demand and the ability to restore prices to more rational and economically worth-while levels. Some signs can be discerned that Russia is now becoming more concerned with the consumption of its own platinum, particularly for the manufacture of glass products and high octane gasoline, but there can be no certainty that exports will not be resumed at the higher prices now obtainable.

During 1958 output from International Nickel Company of Canada, Limited was severely curtailed, first by a voluntary cut in nickel production, and later by strikes at Sudbury, Canada. Production recommenced January 1959 on a limited scale, but was shortly afterwards brought up to full capacity, and has so continued. Figures are not available, but a likely estimate of platinum output in the year would be around 175,000 ounces.

Goodnews Bay Mining Company, the only United States producer, continued to operate its dredge and draglines during its May-to-November season in Alaska, output running again around 15,000 ounces.

In Colombia, South American Gold and Platinum Company continued its dredging operations, despite governmental frustrations. In 1958 output totaled 17,750 ounces, but a somewhat lower figure is estimated for 1959.

The South African producer Rustenburg Platinum Mines Limited—since 1956 the largest individual source of platinum—restored the earlier production cuts in several stages during the year, but still has appreciable capacity unused, including the additional milling plant erected in 1957 at a cost of some \$5,000,000. Here again production figures are not leased, but it would appear that output is now running at around 300,000 ounces troy per annum, against a possible capacity of 350,000 to 400,000 ounces. Rustenburg recently emphasized, in association with its sole refiner and distributor, Johnson, Matthey & Co., Limited of London, England, its determination to insure adequate and continuing supplies to industry. It has pointed out that, alone among suppliers, it is in a position to vary its output at short notice to suit the circumstances of the market from time to time. Production has deliberately been adjusted to a level slightly in excess of present demand in order that stocks may be built up, and employed, if necessary, to modify any excessive price increases occasioned by periodical shortages of metal.

Demand for the other platinum group metals, particularly palladium and rhodium, has been unusually strong, with some pressure on supplies.

POTASH

"All domestic facilities are expected to operate at near maximum capacity throughout 1960"



David J. Stark
Vice President for
Operations
Agricultural Chemicals
Division
International Minerals
and Chemical Corporation
Skokie, Illinois

New production and sales records were set by the domestic potash industry in 1959.

Overall sales jumped 19% percent and domestic sales 18 percent. Production reports indicate an increase of nine percent, a sharp contrast to the three percent decline in 1958 and a gain which re-establishes the long-term growth pattern of four percent a year.

Price fluctuations on the world market, caused by a swing to a buyer's market in 1958, had less effect on the United States

potash industry than had been expected. The market, which had been unsettled for two years, showed greater stability in 1959.

Potash use, which leveled out from 1956 to 1959, increased sharply in 1960, justifying the build-up in production capacity made in anticipation of long-term growth. Inventories which had been building steadily through the years to 1958, declined substantially in 1959. All domestic facilities are expected to operate at near maximum capacity throughout 1960. The 10 percent loss in industrial business in 1958 was more than regained.

Domestic production in 1959 totaled 2,360,000 tons of K_2O , up an estimated 200,000 tons over 1958. Deliveries exceeded production by 212,000 tons as producers reduced inventories.

In addition, K_2O exports rose sharply, with 316,000 tons in 1959 compared to 220,000 tons in 1958, roughly a 43 percent gain. Imports dropped substantially, from 250,000 tons in 1958 to 195,000 last year. Imports represented less than 10 percent of the potash sold within the United States, and exports exceeded imports, a sharp reversal of the 1958 situation.

The problem of rising costs has been aggravated in the last 10 years by a trend away from standard muriate of potash to coarse and granular materials. Production for this market, and the demand for more uniform-sized products, have necessitated purchase of equipment that raised production costs without increasing production capacity.

Production of Canadian potash, expected to start in 1959, was delayed and won't begin until late 1960 or early in 1961. This means domestic producers must operate near capacity to meet demand.

A water-bearing sand formation has hampered the efforts of major producers of fertilizers to get to the Canadian potash deposits—believed to be the world's richest.

The first producer has reportedly suspended production because of a flow of water into its concrete shaft and underground. The other producer is going to block off the troublesome Blairmore sands by using a cast-iron mine shaft lining. Used successfully in Europe to solve similar problems, the technique is called "tubbing." This is a vertical application of cast iron tunneling commonly used under rivers and lakes. A

German firm, Haniel & Lueg, which specializes in the "tubbing" technique, will direct the installation.

No other United States companies are currently active in the area, but a German company, Alwinal, has been doing some preliminary exploration and several United States firms blocked out acreage.

In the United States, Delhi-Taylor is exploring the King Creek deposit near Moab, Utah. The firm announced it might be in production there within the next two years.

Farm Chemicals Resource Development Corporation reported it is continuing pilot plant operations in the Permian Basin, seeking a satisfactory flow sheet. The company completed a concrete lined shaft, 15 feet in diameter, in the Lea County area in 1957.

National Potash Company reported substantial processing equipment changes to improve product quality and recoveries. In addition to new de-sliming, crystalizing, compacting, and screening equipment, the firm has installed equipment to pre-dry ore before processing. This company has also contracted to purchase and refine ore from the Southwest Potash Company.

In other areas, Bonneville Ltd., producing potash from salts crystalized by solar evaporation near Wendover, Utah, reported no basic changes in plant or process. American Potash & Chemical Corporation added two new crystalizers to its potash recovery unit at Trona, California, to increase the crystal size of the muriate of potash.

In summary, it appears that the margin between potash production facilities and market demand for the production has narrowed to a point where the industry is in balance.



Clark L. Wilson
Vice President
New Park Mining
Company
Salt Lake City, Utah

SILVER

"The silver consumer is being subsidized largely by the base metal mining industry"

The United States produced 24,000,000 ounces in 1959 or 12.5 percent of the Free World total. Consumption was 100,000,000 ounces in the arts and industry, and 40,700,000, in coinage, for a total of approximately 50 percent of the Free World consumption.

Silver uses are fortunately becoming more diversified as time goes on. Consumption for jewelry, sterling, and plate ware will certainly continue in proportion to the growth of the population.

Mr. Elgin Groseclose has recently pointed out before the House Subcommittee on Mines and Mining that monetary economists smile at the mention of silver as a monetary metal. At the same time, reports from the Director of the Mint disclose an interesting paradox. Year after year this country is demanding more and more silver for its coinage. In 1913, on organization of the Federal Reserve System, the annual requirement for silver coinage was 10,000,000 ounces. Today, even with the vast substitution of paper money for metal, subsidiary coinage has been consuming between 30,000,000 and 40,000,000 ounces annually and in 1959, world consumption for coinage was 84,200,000 ounces. There are several reasons offered for this demand—the expanding population, the general era of prosperity, and particularly the increase in vending machines requiring coins.

Most people today still regard silver of value for its use in silverware, jewelry, and coinage. During 1958, the industrial uses of silver accounted for over half of the estimated 250,000,000 troy ounces of silver consumed in the Free World. Figures are not available for 1959, but presumably have a similar relationship. Industrial applications are expected to increase, with silver in the arts becoming less important percentagewise as a market for the product.

The most important industrial demand continues to be for photography. United States industry alone uses an estimated 30,000,000 ounces annually or about half as much again as was consumed at the turn of the century for all domestic commercial use. Silver is now being used as a solder for bonding practically all non-ferrous metals and alloys, as well as iron and steel. This is the second most important industrial outlay for silver with

annual consumption in the United States currently amounting to 20,000,000 to 24,000,000 ounces. A third rapidly growing industrial use for silver is in the electrical industry for all forms of electrical contacts where low contact resistance is important. The demand for silver for these purposes is estimated to be between 18,000,000 20,000,000 ounces annually.

A great deal of attention has been given recently to use of silver in batteries. Silver-zinc batteries weigh as little as one-sixth that of the conventional battery of similar capacity and require one-sixth the space. A discharge at constant voltage levels will offer great attraction for application in jet aircraft, portable television, cameras, torpedoes, guided missiles and other uses. A possible adaptation for use in atomic submarines could create a substantial demand for silver.

United States Treasury policy continued to control the price for silver throughout the world. Treasury sales to industry totaled 33,200,000 ounces in 1959 which together with the 40,700,000 ounces used in subsidiary coinage, reduced the free-silver stocks to 175,100,000 ounces on December 31, 1959.

Free World silver production decreased to 195,600,000 ounces in 1959 from 211,300,000 in 1958. Production from most major countries was fairly constant, with Mexico showing some decrease. The big decrease was in the United States, due to the strike at

Free World Production and Consumption of Silver From 1955 Through 1959¹

Year	Mine Production	Arts and Industry	Consumption	
			Coinage	Total
1955	198,400,000	192,800,000	52,600,000	245,400,000
1956	199,500,000	210,200,000	56,500,000	266,700,000
1957	204,600,000	213,000,000	84,200,000	297,200,000
1958	211,300,000	187,400,000	65,100,000	250,500,000
1959	195,600,000	211,800,000	84,200,000	296,000,000
Five year averages	201,900,000	203,000,000	68,100,000	271,100,000

1. Handy and Harman.

major copper refineries beginning in August. Treasury silver sales, during the period, increased markedly.

The Treasury Department has indicated that should the "free silver" supply be exhausted, the "existing legislation does not prevent retirement of silver certificates and the use of the silver thus freed for the manufacture of subsidiary coinage". They also indicate, however, that this silver is carried at its monetary value of \$1.29 per ounce and if sold to industry, it would be at this price to the producer. This is another indication that the government should discontinue sales to industry and a market price will result that will encourage world production needed to balance supply and demand.

It is noteworthy that imports of silver into the United States (exclusive of lend-lease returns) dropped from 68,500,000 ounces in 1958 to 61,200,000 in 1959. At the same time, exports from the United States rose from 2,700,000 ounces in 1958 to 8,800,000 in 1959, as foreign producers and some in the United States, with exportable silver, sought more favorable markets abroad. It appears that United States Treasury sales, while limited to domestic consumers, were, in some instances, supplying domestic consumers with cheaper silver to replace exportable silver which was sold abroad at higher prices.

In summary—there was a substantial increase in the demand for silver throughout the world in 1959. World production was down due to smelter strikes. The United States Treasury sold substantial quantities of metal to industries. If the United States government continues its present policy, prices will remain stable at present levels during 1960. These policies must change as consumption continues to increase and there should be a better silver price sometime during the 1960's.

The future of silver is most encouraging for the silver producer. There are naturally some "pitfalls", but silver consumption in the Free World continues to exceed production and this imbalance will no doubt continue until production is stepped up through an increased silver price.

The accompanying table indicates Free World production for 1959 at 195,600,000 ounces and consumption at 296,000,000 ounces. Similar figures over the past 10 years indicate this same relationship, with use in the arts and industry increasing. Consumption for coinage is more erratic, but it does show a general increase during the past seven years and had a marked increase in 1959, due principally to coinage programs in Italy and France. It is interesting to note the increased silver usage in 1959, following a recession year in 1958.

SULPHUR

"Consumption of sulphur hit a new all-time high during 1959"

Consumption of sulphur in the United States recovered from a two-year decline in 1959 to reach a new record high—about 6,000,000 long tons—an increase of better than 10 percent over 1958. The previous record of 5,800,000 tons was established in 1956.

The use of sulphur reflected the pick-up of business by major consuming industries such as fertilizer, chemicals, paper, pigments, and rayon. Although demand by the steel industry dropped as a result of the strike. The weakness in this market was more than offset by the prosperity of most of the other consuming industries.

Exports of sulphur rose to a near-record level despite strong competition in foreign markets. Such shipments were estimated to have exceeded 1,600,000 tons.

Domestic sulphur production was up slightly in 1959. Output from all sources amounted to an estimated 6,225,000 long tons, compared with 6,140,000 tons in 1958. Most of the increased demand was met from stockpiles of producers, who cut back stocks from 4,000,000 tons to about 3,400,000 tons.

Of the total production, 4,553,634 tons were elemental sulphur mined by the Frasch hot-water process from salt dome deposits located along the coast of Louisiana and Texas. Of the balance of the output, 740,000 tons represented elemental sulphur recovered from refinery gases and sour natural gas; 450,000 tons sulphur contained in pyrites; and 510,000 tons sulphur in various forms from other sources.

World-wide consumption also set a record—about 16,000,000 long tons. Elemental sulphur production was about 8,100,000 long tons. The difference between production and consumption being met by pyrite, smelter gases, and other sources. A notable increase in elemental sulphur output was made by France to place it the world's third largest producer behind the United States and Mexico. Canada passed both Italy and Japan to place fourth. Italian production fell during the year.

In the United States four companies produced Frasch sulphur from 12 mines. Duval Sulphur and Potash Company successfully started production from deep, 3,156-foot wells, for the first time at Orchard, Texas to set record for deep Frasch mining. Freeport Sulphur Company operated mines at Lake Washington, Garden Island Bay, and Bay Ste. Elaine in Louisiana; and Chacahoula, Texas. In December the Bay Ste. Elaine mine was shut down as mined out. The surface plant will be moved to a new mine at Lake Pelto, Louisiana. Jefferson Lake Sulphur Company operated mines at Starks, Louisiana; and Long Point and Clemens, Texas. Texas Gulf Sulphur Company, the world's largest producer, produced below capacity during most of the year. Its mines, all in Texas, are at Moss Bluff, Fannett, Spindletop, and New Gulf.

A new mine will start production in 1960. It is the Grand Isle offshore mine of Freeport Sulphur Company in Louisiana. Molten sulphur will be pumped to the mainland through a seven mile long pipe line laid on the bottom of the Gulf of Mexico.



W. Fox
Secretary
International Tin Council
London, England

"World consumption of tin is becoming less dependent on the United States"

During the whole of 1959 the exports of tin from the producing members of the International Tin Agreement remained subject to limitation, although on a scale less severe than in 1958. Consumption of tin metal in the world rose abruptly. The buffer stock of the International Tin Council was in active operation.

Export control applied under the Tin Agreement to the six producing members (Belgian Congo, Bolivia, Indonesia, Malaya,

Nigeria, and Thailand) was maintained at a very low level in the first quarter of 1959 (20,000 long tons as the permissible export amount). Thereafter, in the light of the improvement shown in anticipated consumption, the restrictions on export were eased (23,000 tons in the second quarter; 25,000 tons in the third quarter and 30,000 tons in the fourth quarter). This gave a level over the whole year of some 62 percent of the actual rate of production in the period prior to the beginning of

TIN

control in late 1957.

Additional sources of supply of tin were also available during the year—from Russia and China, from other countries not in the Agreement, from the disposal of certain non-commercial stocks, and from the sales out of the buffer stock of the International Tin Council.

During the year relatively little tin (perhaps under 1,000 long tons) came directly from Mainland China onto the world market. Imports from Russia into non-Communist countries were still important (of the order of 10,000 to 11,000 tons in 1959) but were much below the 1958 level (over 17,000 tons). It will be remembered that an understanding had been reached for 1959 between the Council and Russia regarding the reduction of tin exports from Russia during 1959.

Supplies from other tin-producing areas (for example, Burma and Laos) showed relatively little change.

World mine production (excluding Russia) was slightly higher in 1959, at 137,000 tons than it had been in 1958 (134,000 tons). World consumption of tin is becoming less dependent on the United States. (This proportion of the total was 38 percent in 1951 to 1954, and 36 percent in 1955 to 1958 and under 30 percent in 1959). During 1959, in spite of the shut-down of most of the United States tinplate plants during the steel strike, world consumption rose sharply to some 163,000 tons. This was one-tenth above the 1958 level and is the highest figure reached since the end of World War II. The weakness in the United States intake was more than counter-balanced by the upsurge in West Germany, Denmark, Japan, and elsewhere in Western Europe.

One element in the tin position was new in 1959. Some of the producing members of the Council, in view of the steady increase in the stocks of tin in their territories while export control was in force, desired to enter into arrangements for the exchange of tin against surplus farm products held by the Commodity Credit Corporation of the United States. The Council approved, on certain conditions, barter transactions for the Belgian Congo, Bolivia, and Thailand covering some 9,000 tons

**World Tin Position in Long Tons
for 1957, 1958, and 1959**

Country	1957	1958	1959
World Mine Production			
Malaya	59,293	38,457	37,525
Indonesia	27,723	23,201	21,616
Bolivia	27,796	17,731	23,600 ¹
Belgian Congo	14,281	11,163	10,400 ¹
Thailand	13,531	7,726	9,692
Nigeria	9,612	6,230	5,500 ¹
Others	28,000	29,500	29,000
Total	180,000	134,000	137,000
World Metal Production			
Malaya	71,289	45,336	45,729
United Kingdom	34,174	32,551	27,229
Netherlands	29,259	17,098	9,592
Others	41,000	46,000	52,000
Total	175,000	141,000	134,000
World Metal Consumption			
United States	54,429	47,998	46,250 ¹
United Kingdom	21,787	20,413	21,345
Others	79,000	79,500	95,500
Total	155,000	148,000	163,000¹

1. Estimated

of tin. This tin is exported over and above the normal permissible export amount and, when acquired, is transferred by the Commodity Credit Corporation to the supplemental stockpile.

It is not possible to predict the tin position for 1960. But the present Tin Agreement (which runs for five years) is due to expire on June 30, 1961. A United Nations Conference in New York in May, 1960 will discuss the question of a new Agreement. This Conference will include members and non-members of the present Agreement and will undoubtedly evaluate carefully the work of the International Tin Council since its inception.



Dr. Russell C. Nelson
Head, Metallurgical
Research
Sylvania Electric
Products, Inc.
Towanda, Pennsylvania

TUNGSTEN

"Tungsten research is prompted because it
is logical to consider use for the Space Age"

With the collapse of the tungsten market in 1958, domestic production reverted to the 1949-1950 level, and virtually all of this material came as the byproduct of two molybdenite operations. The situation in 1959 was not substantially altered. However, there were signs of encouragement reflected in several avenues, which, while not of immediate assistance to domestic mines, nevertheless hold more promise for the future.

On the world market tungsten ore prices closed out 1959 at a value 50 percent higher than at the beginning of the year, although prices for domestic offerings exhibited much less fluctuation and closed about 10 percent higher. Softening occurred in the world market from February through April. At that time it was felt that this was partially due to heavy offers of ore in Europe from Russia and possibly Red China, and partially to stockpiling of ore by buyers in the fall of 1958.

Extensive metallurgical research was carried on in 1959 aimed at developing new uses for tungsten particularly in the field of high temperature applications. The U. S. Bureau of Mines announced several new tungsten developments during the year from three of its Metallurgy Research Centers. A means of vapor-depositing extremely pure tungsten was developed at Rolla, Missouri. This technique allows tungsten to be formed into tubing and other simple shapes which were difficult to fabricate, as well as yielding a simple means of plating other metals with tungsten. Work at Reno, Nevada, centered on the recovery of both tungsten and molybdenum from scheelite concentrates by the electrolysis of fused salt baths. If proven economically feasible, this technique would permit production of valuable tungsten and molybdenum from scheelite operations which otherwise would be unprofitable. Researchers at

Albany, Oregon, have produced "soft" tungsten by reacting calcium with tungstic oxide in a reduction bomb. Unlike tungsten produced by conventional techniques this material can be cut with a hacksaw and worked at low (for tungsten) temperatures. Further developmental work is continuing in all three of these programs.

An estimated \$2,600,000 was spent on tungsten development last year in the United States and 40 percent of this was supported by federal agencies. Tungsten research is prompted because it is logical to consider use for the Space Age. It has the highest melting point of any metal and exhibits good strength at elevated temperatures. However, tungsten has been difficult to fabricate, has a high density, and poor oxidation resistance, factors which have limited its development. In May, a two day conference on tungsten development was held in Durham, North Carolina, co-sponsored by the Army Office of Ordnance Research and nine other contracting agencies. Reports of work in progress centered on production of high purity tungsten to improve optimum properties for use as a structural material; an evaluation of the effects of trace impurities on the properties of tungsten; development of tungsten-based alloys having improved ductility and oxidation resistance properties; improved techniques for forming and fabricating tungsten; and protective coatings for oxidation resistance.

Industrial developments and expansions were also highlighted during the year. Fansteel Metallurgical Corporation announced a breakthrough in tungsten fabricating techniques by developing methods for forging, hot extrusion, deep-drawing, and spinning. Sylvania announced that it had cracked the size barrier for tungsten by installation of a new powder press which

could produce tungsten billets 10 inches in diameter, 4 feet long, weighing 3,000 pounds. In addition, this hydrostatic press makes it possible to produce unusual shapes and sections with a minimum of additional equipment.

Encouraging plans were announced by two domestic producers. Union Carbide Nuclear Corporation expanded its tungsten refinery near Bishop, California, to enable it to produce a high-purity ammonium paratungstate product. The new unit went on stream at the end of 1959. Minerals Engineering Company reopened its refinery at Salt Lake City, Utah and plans to produce a high-purity ammonium paratungstate on a commercial basis. The Minerals Engineering Company became sole owner of the Salt Lake Tungsten Company, when it purchased the half interest owned by Sylvania Electric Products Inc. The

ammonium paratungstate product of both of these refineries is an important raw material for tungsten powder used in the manufacture of cemented carbides, and for tungsten wire for electrical and electronic applications. Minerals Engineering also reactivated its Calvert Creek, Montana open-pit tungsten mining and milling operation to produce feed material for the Salt Lake City refinery. The Salt Lake Tungsten Company also will resume purchasing tungsten concentrates from independent mills and producers.

In summary, it appears that the future hope for domestic mines is centered on metallurgical research and development projects aimed at devising new large scale uses of tungsten which in turn will increase the demand and price for tungsten ore.



W. Spencer Hutchinson, Jr.
Director, Source Material
Procurement Division
United States Atomic
Energy Commission
Grand Junction, Colorado

"More substantial sales to private industry in 1960 may result from test purchases in 1959"

URANIUM

The year 1959 was marked by increasing stability in the United States uranium industry and a substantial rise in production of uranium ore and concentrates. This production, together with receipts from foreign sources, continued at levels adequate to meet current requirements.

Adjustments to provide a market for developed ore reserves will probably result in a production rate exceeding the requirements in the next few years. Significant production information and other statistics on the domestic uranium industry were made public in mid-year.

Domestic ore production reached a total of 6,900,000 dry tons during 1959, and production of uranium concentrate (U_3O_8) totaled 16,390 tons. The development of ore supplies by private companies continued at a high level. Preliminary figures indicate ore reserves increased from 82,500,000 tons at the end of 1958 to 86,000,000 tons on December 31, 1959, a net increase of 3,500,000 tons during a period when approximately 6,900,000 tons were mined.

In calendar 1959, United States uranium production increased 30 per cent over that in 1958, and this country was in first place among the Free World uranium producing countries.

Receipts of uranium concentrates from domestic sources, which in Fiscal Year 1959 constituted about 45 per cent of the total procurement, are expected to exceed those from foreign sources in Fiscal Year 1961.

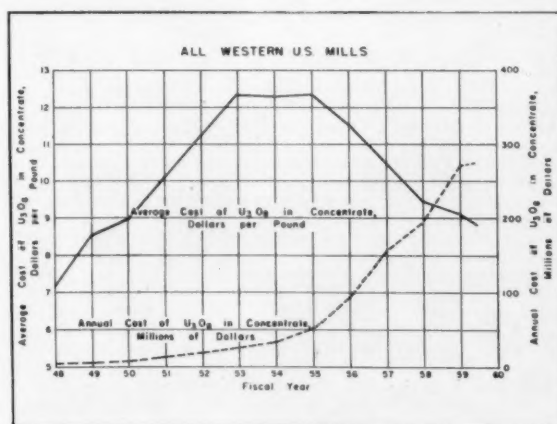
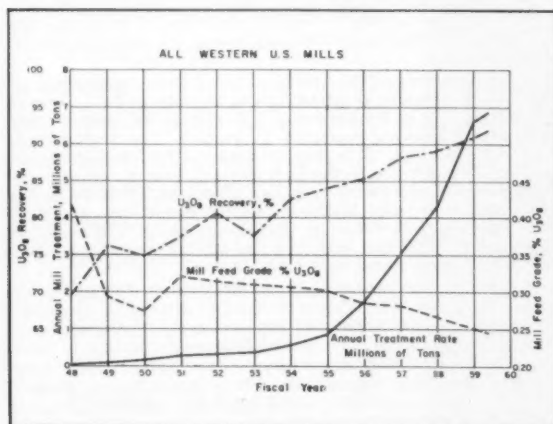
At the end of calendar 1959, 23 uranium processing mills were in operation in western United States having a total nominal treatment rate of about 21,410 tons of ore per day. The estimated total initial cost of these facilities is reported to have been \$136,920,000. Two new plants went into operation early

United States Uranium Concentrate Procurement Statistics From Domestic and Foreign Sources

Fiscal Years	Domestic (Tons- U_3O_8)	Foreign (Tons- U_3O_8)	Total (Tons- U_3O_8)
1943-47 inclusive	1,440	10,150	11,590
1948	110	1,960	2,070
1949	120	1,960	2,080
1950	320	2,740	3,060
1951	630	3,050	3,680
1952	830	2,830	3,660
1953	990	1,910	2,900
1954	1,450	3,240	4,690
1955	2,140	3,800	5,940
1956	4,200	6,240	10,440
1957	7,580	8,580	16,160
1958	10,244	16,132	26,376
1959	15,162	18,164	33,326

in 1960, the Globe Mining Company plant in Natrona County, Wyoming having a capacity of approximately 490 tons per day and the Cotter Corporation plant at Canon City, Colo. (expansion of a 50-ton-per-day pilot plant) having a capacity of 200 tons per day. This gives the western United States a total of 25 uranium ore processing mills with a total nominal treatment rate of about 22,100 tons of ore per day.

The Government-owned uranium mill at Monticello, Utah, was shut down in December 1959 after 10 years of operation under the Commission's program. Operation of the Commission ore buying station at Monticello is to continue until satisfactory arrangements have been made with private mills in the area for the purchase of roscoelite-carnotite type ores from operators desiring to ship such ores under provisions of Circular 5, Re-



vised.

During 1959 the activities of the Commission in enforcing its licensing regulations as they apply to the uranium mills was continued and the industry became increasingly aware of the need to control the radiation hazards affecting both mill employees and the general public. Most of the mills found it necessary to develop or to acquire capabilities in this technologic area.

The U. S. Public Health Service in cooperation with the state health agencies in Colorado and New Mexico conducted extensive surveys on the effect of effluents from the Durango, Colorado mill of the Vanadium Corporation of America on the Animas River. The initial survey showed that the river water contained radium originating at the mill at concentrations above permissible limits at down stream points of examination. As a result of this radiation, Vanadium Corporation of America carried out corrective actions at the mill of such an extent that a subsequent resurvey showed that the hazards had been greatly reduced.

In regard to airborne dusts within the plants in the industry, much progress has been made in effectively isolating points of dust generation.

The radiation hazard due to radon gas and its daughters in mine areas was subject to state regulations. The AEC does not have statutory authority in this area. However, it has been active in regard to mine operation under AEC leases and has worked closely with the state agencies.

Deliveries of foreign uranium concentrates to the United States during 1959 amounted to 18,120 tons of U_3O_8 , with 13,680 tons originating in Canada and the rest in Australia, Belgian Congo, Portugal, and South Africa.



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Preliminary reports indicate that zinc consumption in the Free World made an exceptional recovery in 1959 from the recession levels of 1957 and 1958. Although production of slab zinc was somewhat greater than in the previous year, it is estimated that by year-end production and consumption had been brought approximately into balance. This favourable position, following several years of successive surpluses, resulted in a firming of zinc prices in the United States at 12½ cents per pound during the last quarter, rising to 13 cents early in January 1960, and a steady price increase on the London Metal Exchange to £96 at year-end. Prices at the beginning of the year were 11½ cents in the United States and £75½ in London. Producers' stocks of zinc were generally reduced, particularly in Europe. Those in the United States fell from 190,000 short tons at the beginning of the year to 154,000 short tons on December 31, 1959.

According to estimates of the American Zinc Institute covering the world's major consumers, zinc use in the United States rose in 1959 to 944,000 short tons, or about 9 percent above the 1958 total. The steel strike in the last half of the year caused a decline of 26,000 tons from the 1958 level of shipments to the galvanizing industry, but gains of 51,000 tons in die casting use, 30,000 tons in brass, with minor increases in the other outlets, resulted in an overall consumption increase of 76,000 tons. Large increases were reported also in the United Kingdom and West Germany, while consumption declined in France, and the Netherlands, and remained substantially the same in Belgium-Luxembourg and Italy.

Increased consumption was reported in the first nine months of 1959 in Australia, Sweden, Norway, and Denmark, according to the American Bureau of Metal Statistics. Consumption in India declined sharply in the same period. An increase of about 14,000 for the year was recorded in Canada. Consumption statistics for Japan are not available but the substantial increase in production indicates that consumption may also have risen.

The overall increase in zinc use by Free World countries in 1959 is estimated at between 8 and 9 percent.

The United States Atomic Energy Commission announced in November that the United States Government would not be in a position to exercise its options to purchase additional Canadian uranium concentrates in the post-1962 period. This announcement was coupled with publication of a stretch-out agreement between the Commission and Eldorado Mining and Refining, Ltd., which would permit the Canadian producers to defer part of the delivery which would have been made over the next three years into the period March 31, 1962, through December 31, 1966. Under the stretch-out agreement, which was also made public to the Canadian industry by the Canadian government, the Commission's total Canadian uranium commitment remains unchanged in respect to pounds to be delivered and the prices to be paid under the existing contracts. Because the product to be delivered has been counted upon by the Canadian companies to provide amortization payments due in the pre-1962 period, an advance payment of \$2.50 per pound of U_3O_8 will be made by the Commission with respect to each pound now deferred. These payments will be made at approximately the same time as the deliveries of these pounds would have been made had there been no deferment. The new plan provides for a single contract between the Commission and Eldorado covering the total commitment instead of a number of contracts.

A number of individual sales of uranium concentrates were made by domestic producers to both domestic and foreign private industries in 1959. These were relatively small sales of up to a few tons of U_3O_8 , but were indicative of private industry's interest in exploring commercial uses for the product. The year 1960 may bring about more substantial sales based on these preliminary test purchases.

ZINC

**"Stocks of zinc will be cut in 1960;
world mine and smelter output increased"**

Available reports for 1959 indicate that the production of slab zinc in the Free World increased by about 3 percent over the 1958 total. United States output rose by 29,000 tons to a total of 858,000 tons, although production of The Anaconda Company was closed down after mid-August by a strike. Japan recorded the only other large production increase: 18,000 tons in the first 10 months of 1959. The other major producers maintained output at, or slightly above, 1958 rates.

Zinc ore production in 1959 is estimated to have been substantially the same as in 1958. United States, the world's leading producer in 1959, increased its output by 3,000 tons to a total of 417,000 tons. According to available statistics many countries made similar small production increases. Output from Canada, the world's second producer, dropped from 425,000 short tons in 1958 to 394,000 short tons in 1959, and Australian output fell by 13,000 long tons to an estimated 250,000 long tons.

Imports of refined zinc into the United States, under lead and zinc quota regulations established in September 1958, were reduced in 1959 to 80 percent of the level of the previous year. Imports of zinc ore increased 11 percent. The United States Tariff Commission in September began a further investigation of current conditions in the lead and zinc mining industry; due to report to Congress, on or before March 31, 1960, its findings with regard to what additional import restrictions, if any (by way of increased duties or import quotas, or both) need be imposed in order that lead and zinc mining operations may be conducted on a sound and stable basis.

Regarding the current outlook, attention is directed to two recent forecasts. The United States Department of Commerce forecasts for 1960 a 15 to 17 percent rise in zinc consumption in the United States. The United Nations Study Group, whose forecast for 1959 was conservative, estimates for 1960 a record high in world zinc consumption. The prospect then is, stocks of zinc will be cut in 1960; world mine and smelter output increased, as required, to meet the improved demand for zinc.

UNITED STATES

mining highlights

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Alaska

► Kennecott Drills Kobuk River Copper; Molybdenum Discovery Near Anchorage

Alaska's mineral production in 1959 is estimated to have a value of a little over \$19,000,000, a drop of 9 percent from that of 1958. Since the post-war peak year of 1957, the decrease has been nearly 37 percent. Gold, coal, and sand and gravel are the three most valuable commodities, though gold decreased 8 percent from 1958 and coal decreased 20 percent.

Lode gold mining is practically nonexistent in Alaska, and placer operations continue to be squeezed shut by increasing costs. The major portion of the gold production was, as usual, by the United States Smelting Refining and Mining Company from its dredging operations, but these are declining each year. Two of its dredges shut down permanently this past fall. Goodnews Bay Mining Company operated as usual in the Bristol Bay area and continues to be the largest United States platinum producer. DeCoursey Mountain Mining Company changed its name to Alaska Mines and Minerals Company, and remained the only significant base metal producer (mercury) in Alaska.

SOUTHEASTERN—Several drilling projects were carried out during the year. A syndicate managed by Moneta Porcupine Mines, Ltd. drilled a larger copper deposit at Endicott Arm and continued its reconnaissance work in the region with a crew of prospectors. C. T. Takahashi Company of Seattle drilled an iron body on the North Bradfield River. Mt. Andrew Mining Company (Utah Construction and Mining Company) continued its drilling and other exploratory work on various iron and copper prospects. A large nickel deposit was drilled, and will be drilled further. Columbia Iron Mining Company (U. S. Steel Corporation) continued its drilling and other activities.

SOUTH CENTRAL—A molybdenum discovery was made west of Anchorage which may turn out to be of major proportions. The Bering River Coal field was investigated further in the interest of developing an export operation for the field's coking coal. Humble Oil and Refining Company drilled the large iron prospect that it discovered and staked in 1958. Two major copper mining companies had reconnaissance parties in the field in this and the following two regions.

YUKON BASIN—Exploration continued in the mercury belt. Cordero Mining Company was again active. The 1958 discovery was prospected further and the work on it will continue in 1960.

NORTHWESTERN—The large copper prospect north of the Kobuk River was drilled for the third successive year by Bear Creek Mining Company (Kennecott), and this project will apparently continue.

Arizona

► Kennecott Pays \$4,000,000 For Safford Claims; Asarco Starts Mission Project

The value of Arizona's mineral production in 1959 was \$326,316,000, with copper accounting for \$266,104,000 or 82 percent of the total.

For the first seven months of 1959 Arizona's copper mines produced at the annual rate of 556,000 tons, but strike shut-downs during the last five months caused a production loss of about 126,800 tons; therefore, the total output in 1959 was 429,200 tons, compared to 485,839 tons in 1958. However, the value of the copper produced was \$10,552,686 higher because of the higher average price—31 cents a pound in 1959 versus 26.3 cents in 1958.

Arizona gained a major copper producer in March when Duval Sulphur and Potash Company started production at its Esperanza mine and 12,000-ton flotation plant near Tucson, following the removal of 5,000,000 tons of overburden.

American Smelting and Refining Company announced production plans for its Mission project open-pit mine near Tucson. Estimated cost is \$43,500,000 for mining and milling facilities with a daily capacity of 15,000 tons of ore and an annual output of 45,000 tons of copper. Stripping of 200 feet of gravel wash material started late in the year.

Kennecott's Ray Mines entered the third phase of its \$40,000,000 expansion program. This new construction increases the capacity of the mine and mill from 15,000 tons of ore daily to 22,500 tons to equal the rated capacity of the new smelter. It will enable the property to produce 20,000 additional tons of copper annually.

Phelps Dodge started a \$5,000,000 expansion of its Lavender Pit mine at Bisbee. The enlargement will extend the life of the mine by about seven years.

Inspiration Consolidated Copper Company started sinking the McDonald shaft at the Christmas mine near Winkelman. This is an 18-foot diameter circular shaft, planned for a depth of 1,700 feet. The Christmas mine is being developed and equipped to produce 4,000 tons of ore daily, or 36,000,000 pounds of copper annually, with production scheduled for the fall of 1961. At its Inspiration mine, Inspiration achieved full benefits of the dual metallurgical process, producing 95,000,000 pounds of copper in 1959 for the highest annual output since 1943. Results attained at the leaching plant refining operations were so successful that a new addition to the electrolytic tank house is planned.

Miami Copper Company terminated 48 years of underground mining at its Miami mine June 26. A large portion of the copper remaining in the mine will be recovered by in-place leaching and precipitation.

Banner Mining Company started sinking a new five-compartment 1,100-foot shaft to develop a high-grade ore body discovered by diamond drilling at its Palo Verde mine, a new development near the company's producing Daisy mine.

South of Casa Grande, stripping operations were started by Transarizona Resources, Inc., at the old Lake Shore group. The company proposed to utilize the segregation process for treating oxidized and mixed oxide-sulphide copper ores—the first commercial plant of this type in the United States.

Major attention was directed toward the Safford area in Graham County when Bear Creek Mining Company (Kennecott's exploration subsidiary) purchased 120 unpatented mining claims for \$4,000,000, following three years of exploration by diamond drilling. The work indicated a large low-grade copper deposit of mixed oxide and sulphide minerals. Development drilling and geological field work were continuing at year's end. To the north of Kennecott's holdings, Phelps

Dodge optioned and located a large group of claims and launched its own drilling program. Later, American Metals Climax, Inc. optioned 254 claims and did some preliminary drilling.

Shattuck Denn Mining Corporation's Iron King mine was the state's leading producer of both lead and zinc. Cyprus Mines Corporation resumed production at the Old Dick mine near Bagdad in January, milling approximately 250 tons of zinc-copper ore daily. The Johnson mine of Coronado Copper and Zinc Company near Willcox was reopened by McFarland and Hullinger who shipped the ore to their Sahuarita mill for treatment. As a result of these operations, zinc production totaled 76,200,000 pounds in 1959, valued at \$8,678,000.

Termination of the government's manganese purchase program in August brought a virtual end to manganese mining. Shipments of manganese ore and concentrate in 1959—of 35 percent or more manganese—were valued at \$5,724,000.

Uranium production dropped 7 percent in quantity and 10 percent in value below 1958 output and was confined to three areas: The Four Corners district; properties near the 250-ton mill of Rare Metals Corporation at Tuba City; and the Orphan mine on the rim of the Grand Canyon. Total production was 239,000 tons of ore valued at \$6,334,000.

California

► Wide Variety of Minerals Mined; Non-Metallics Form Large Part of Industry

California's mines and saline playa deposits continued to yield a wide variety of mineral products during 1959. Several new records, both in tonnage and value, were set by the mining industry while production was greater than in 1958 for a wide list of mineral products.

Tungsten, lead, and zinc production increased. Manganese output of 20,500 short tons had an all-time high in value of \$1,606,000. However, by year's end the termination of the Federal government's manganese program brought a halt to this section of the state's industry.

The non-metallic mining industry enjoyed one of its best years with increases in output of lime, gypsum, clay, diatomite, talc soapstone and pyrophyllite, feldspar, perlite, barite, and asbestos. New all-time highs in both tonnage and value were set by the diatomite and gypsum industries. The Anaconda Company mined sulphur for its Weed Heights, Nevada sulphuric acid plant.

The so-called saline minerals—borates, magnesium compounds, sodium salts and their byproducts—elemental bromine, potassium salts, lithium compounds, and iodine—recorded increases in output. Borate minerals set new records as output was expanded at both the open pit mine and refinery of the Pacific Coast Borax Division of United States Borax and Chemical Company at Boron, and the Searles Lake saline plant of American Potash and Chemical Corporation.

Interest in California asbestos deposits reached an all-time high with the Jefferson Lake Sulphur Company finishing exploration at its leased Voorhees mine of American Asbestos Company near Cop-

peropolis where it plans to build a \$5,000,000 mill.

Southwest Oil Company explored the Butler Estate asbestos mine in Fresno County. Also active in the same district was Union Carbide Nuclear Corporation which expanded its holdings in the district west of Coalinga and continued exploration. The Clute Corporation announced plans to expand its mining and processing operations at the Phoenix open-pit mine in Napa County.

Production of iron ore and concentrates from the Eagle Mountain mine of Kaiser Steel Corporation was lower than in 1958 because of the steel strike. Expansion of beneficiation facilities continued with installation of a new crushing plant and better ore train loading facilities.

Union Carbide Nuclear Corporation again operated the state's largest underground mine at Pine Creek near Bishop. This mine was again the leading tungsten, copper, and molybdenum producer. The new plant to produce ammonium paratungstate at the firm's synthetic scheelite plant was nearly completed at year's end.

Only two lode gold mines were operating at year's end. They were the Brush Creek mine of Best Mines Company at Downieville, and the Original 16 to 1 Mine Inc. at Alleghany. Yuba Consolidated Industries operated three bucket line dredges to recover gold from the lower Yuba River, and Natomas Company dredged gold from the flood plain of the American River in Sacramento County. Roy Olson operated a dragline dredge and floating washing plant southwest of Redding.

Mercury production dropped slightly to 20,500 flasks. The New Idria mine of the New Idria Mining and Chemical Company was the leading producer and mined ore from a so-called "new" ore body in an area of the mine which was long thought to be of no economic importance. Sonoma Quicksilver Mines, Inc. at Guerneville sunk a winze, developed the new 12 Level, and started stope preparations on the 1086 Level at its Mount Jackson mine. A new two-ton skip was installed in the shaft and ore pockets cut at main levels. This work interrupted production but will mean lower costs in 1960.

Carrigan Mines Inc. continued exploration and development of its Carrigan uranium property in Tuolumne County.

An unknown high grade manganese ore body was discovered at Shelter Cove in Humboldt County late in 1958. Substantial shipments were made by the Queens Peak Mining Company in 1959.

Central

► **New Viburnum Lead Mine on Schedule; First Off Shore Sulphur Mine at Grand Isle**

ARKANSAS's barite production showed a spectacular gain from 182,779 tons in 1958 to 331,000 in 1959. The United States Glass & Chemical Company announced plans to build a new barite and gravel mill at Dierks, Howard County. Initial production is scheduled for mid-1960 at an annual rate of 35,000 tons of barite and 250,000 tons of gravel.

Bauxite output by Reynolds Mining Corporation and Aluminum Company of America increased 18 percent to 1,487,000 long tons (dried equivalent). Reynolds

Metals Corporation installed equipment to produce hydrated alumina at its Hurricane Creek plant. The product finds a ready market in the ceramic color and chemical industries because of its unique physical and chemical properties.

With the end of the federal government's manganese purchasing program in August, production of manganese ore (35-percent plus Mn) fell from 22,221 tons in 1958 to 15,800 tons.

ILLINOIS continued to be the largest domestic fluorspar producing state despite a drop in output from 152,087 tons in 1958 to 110,000 tons in 1959. This decline was due to the end of the government's acid grade stockpiling program at the end of 1958, the loss in metallurgical fluorspar markets during the steel strike, and the glass molders' strike which cut the demand for ceramic grade fluorspar. Fluorspar mines in southern Illinois recovered larger tonnages of byproduct lead and zinc during the year as the ore milled was higher grade. Byproduct lead was 970 tons (640 in 1958), and zinc was 6,715 tons (6,400 in 1958).

Eagle-Picher Company and Tri State Zinc Company operated their underground zinc-lead mines in the Galena district at capacity during the year. Eagle-Picher operates the Graham mine and 1,500-ton-per-day flotation mill while Tri State's Gray mine and mill have a 1,000-ton-per-day rated capacity. Hickory Hill Mining Company made small shipments from its mine in Galena district. Zinc output from these companies was virtually unchanged at 18,560 tons for the year, but lead output increased from 970 tons in 1958 to 1,155 in 1959.

KENTUCKY'S fluorspar production dropped 34 percent to 17,000 tons from 25,861 in 1959, due to poor market demand. Byproduct zinc and silver production fell accordingly.

LOUISIANA'S mining interest centered on the world's first offshore sulphur mine during 1959. This is the Grand Isle mine of Freeport Sulphur Company which is seven miles offshore in the Gulf of Mexico. The sulphur was found several years ago while drilling for oil. The sulphur wells, hot water plant etc. built on piling driven into ocean floor, and the seven mile mine-to-short molten sulphur pipe line were completed. Jefferson Lake Sulphur Company operated its Starks Dome mine during the year.

Kaiser Aluminum and Chemical Corporation started alumina production from Jamaican bauxite at its new Gramercy plant in May.

Freeport Nickel Company completed its nickel-cobalt refinery at Port Nickel to process imported concentrate from its Moa Bay, Cuba mine and mill. Only metallurgical test samples had been processed by year's end.

MISSOURI continued to be the largest domestic lead producing state with a

105,000-ton output; a decline of only 8,123 tons from 1958 despite a reduced work week at St. Joseph Lead Company (leading United States producer), and no production at all from the Missouri section of the Tri-State district.

Iron ore exploration and development increased at a rapid rate. The American Zinc Lead, and Smelting Company-Granite City Steel Company joint venture continued deep diamond drilling in the Boss-Bixby area after announcing iron and copper discoveries in 1958. Diamond drilling was started for iron by Armco Steel Corporation's Sheffield Division in Jackson and Lafayette counties.

Shaft sinking and mine development at Pea Ridge's deep ore body by Meramec Mining Company was halted by a strike in April. Work was resumed, however, in late December.

Ozark Ore Company, M. A. Hanna Company, was again the largest iron producer from its Iron Mountain underground mine. Total state output was down from 387,000 to 325,000 tons because of the steel strike.

St. Joseph Lead Company proceeded on schedule with mine development, flotation mill construction, and town facilities at its new Viburnum project. This has been termed a second "Lead Belt" and when production starts will have the advantage of mining higher grade ore than is now being mined in the old "Southeast Missouri Lead Belt."

National Lead Company mined, milled, and smelted lead-copper-cobalt-nickel ores at Fredericktown.

Production of barite showed a surprising gain from 199,268 to 300,000 short tons during the year. Increased demand for heavy mud for oil drilling, and chemical industries uses accounted for increased output.

Colorado

► **Largest Domestic Molybdenum, Vanadium, Tin, and Tungsten Producer; Start New Gilsonite Mine.**

Uranium ore tonnage mined and milled in Colorado set a record of 1,039,000 short tons in 1959. However, treatment of lower grade ore, 0.26 percent U₃O₈, made only a small increase in uranium output over 1958. Seven mills operated continuously and at year's end mill expansion to 200 tons per day was underway at Cotter Corporation's Canyon City mill which treats Front Range ores. The other operating mills were: Climax Uranium Company at Grand Junction, Vanadium Corporation of America at Durango, Gunnison Mining Company at Gunnison, and Union Carbide Nuclear Company at Uravan, Rifle, Slick Rock, and Maybell.

Colorado was the leading vanadium producing state as the uranium mills at Grand Junction, Durango, Rifle, and Uravan recovered 7,167,000 pounds of vanadium as a byproduct of uranium milling. Output in 1958 was 4,791,000 pounds. Thus the carnotite type ores of the Uravan Mineral Belt continue as the largest source of domestic vanadium because the Ambrosia Lake, Jackpile, Gas Hills, and Big Indian uranium ores do not contain commercial vanadium content.

The Climax Molybdenum Company operated its Climax molybdenum mine

MINE AND METAL PRODUCTION

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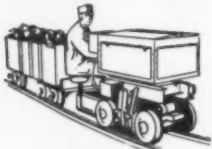



Metal and Mineral Production by States, pages 95 to 99.

Iron Ore Shipments from mines in Minnesota, Michigan, and Wisconsin, page 101.

Open Pit Mine Tonnages at important mines, page 102.

Underground Mine Tonnages from all important mines, page 103.

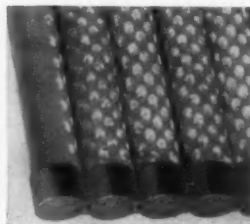
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			ML	17.5
 Mine locomotives	RG	55 ah	ML	43.6
			TLM	5.0
 Shuttle cars	TG	72 ah	TLM	44.0
			TH	20.0
 Battery locomotives	TEG	95 ah	(new type—no prior data)	
	MEG	145 ah	MEH	45.0
			MEX	21.0

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at capacity throughout the year with export sales offsetting lower domestic demand due to the steel strike. This mine was also the largest domestic tin and tungsten producer with the new byproducts plant operating at capacity for the full year. See November 1959 *MINING WORLD*, pages 38 to 43, for a plant description. Deep development continued at the Climax mine, the new tailing pond was started, and greater efficiency of operations was stressed.

A base metal development of major importance—reopening of the Sunnyside mine at Eureka, San Juan County—was started early in the year. Standard Uranium Corporation, a successful Utah firm, gained control of Marcy Shenandoah Corporation which had a lease on Sunnyside from United States Smelting, Refining and Mining Company and formed Shenandoah Limited to reopen the Sunnyside. This is being done by enlarging and extending the American Tunnel from its portal at Gladstone some 9,500 feet underneath the Sunnyside workings which will be reached by raising. At year's end slabbing about 4,700 feet to the breast of the old tunnel was virtually completed. Shenandoah Limited also controls the old Shenandoah Dives Mining Company's Mayflower mine and 800-ton per day flotation mill at Silverton. Exploration was under way in the mine and the mill was being rehabilitated at year's end.

Idarado Mining Company mining the Black Bear and Montana veins through the Treasury Tunnel (Ouray County) and the Mill Level Tunnel (San Miguel County) was the largest producer of lead, copper, and gold. Shortage of steel during national steel strike caused the company to limit its Pandora mill operation to a four-day week during part of the year. Regular mine development was maintained. Silver and zinc were also produced to make Idarado the leading base and precious metal mine in dollar value.

The Eagle mine of New Jersey Zinc Company at Gilman retained its long time rank as the largest zinc producer. Important amounts of lead, silver, gold, and copper were also recovered to make it the second largest base and precious metal producer.

The Rico Argentine Mining Company operated its Rico, Dolores County, mines primarily for pyrite for conversion to sulphuric acid for Colorado Plateau uranium mills. In addition the company reopened its differential flotation mill to treat lead-zinc-silver ores discovered and mined with the pyrite. The Creede, Mineral County operations of Emperius Mining Company made it a major producer of both lead and silver.

Camp Bird, Ltd., an English firm, continued development of its Camp Bird mine in Ouray County with a small crew of men. The old mill at the portal of the lower tunnel was burned to clear the site for a new flotation mill.

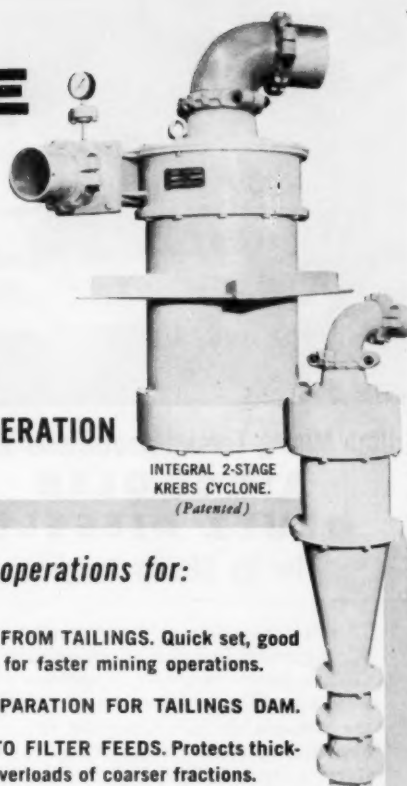
United States Beryllium Company purchased a lease on the Boomer beryllium mine in Park County during the year and operated this unique mine for the beryllium content of several veins. The Mineral Concentrates & Chemical Company conducted tests at its beryllium hydroxide plant at Loveland and a new beryllium oxide plant at Berthoud.

Feldspar, perlite, gilsonite, lime, and gypsum were all mined during the year. Development and production from Colorado's only known gilsonite deposit in Rio Blanco County, 26 miles southwest of Rangely, was started in November.

KREBS CYCLONE

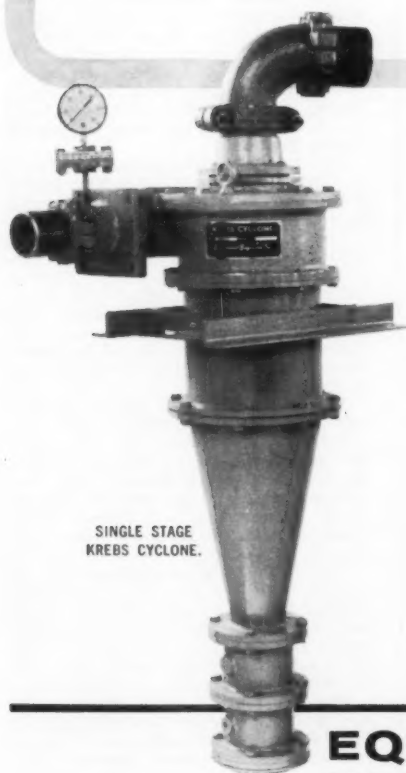
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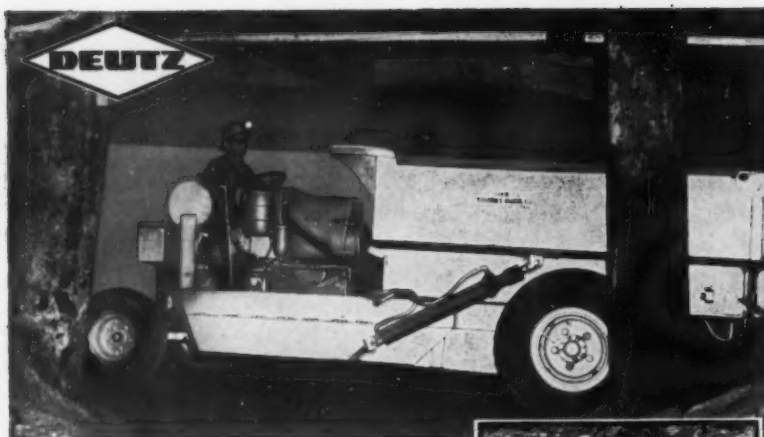


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Utah Mining Truck Manufacturer Picks AIRCOOLED DEUTZ DIESELS for its Shuttle Buggies

The strenuous demands made on its mining trucks in the uranium country of the four corner area determined the selection of Deutz Air-cooled diesels by the Young's Machine Company in Monticello, Utah. Picking the quick-starting Deutz with its high fuel economy, no overheating and maintenance problems proved an invaluable aid in increasing sales for Young's.

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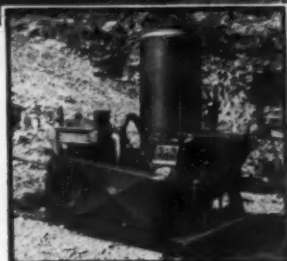
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Mine installation at Rock Springs, Arizona, uses ATLAS COPCO Compressor CT-6 with Deutz-6 cylinder A 6L 514 engine to assure top running efficiency in all temperatures. The semi-portable compressor provides 320 C.F.M.



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PARTIAL SPECIFICATIONS TABLE

MODEL	BHP	RPM
F 1 L 712	10/12	2000/2300
F 2 L 712	20/24	2000/2300
F 3 L 712	30/39	2000/2300
F 4 L 712	40/52	2000/2300
F 6 L 712	60/78	2000/2300
A 2 L 514	28	1800
A 3 L 514	42	1800
A 4 L 514	56/72	1800/2000
A 6 L 514	84/110	1800/2000
A 8 L 514	112/145	1800/2000
A12 L 614	170/220	1800/2000
A 6 L 714	100/125	1800/2000
A 8 L 714	133/168	1800/2000
A12 L 714	200/250	1800/2000

Eastern

► Zinc Production Up In Pennsylvania and Virginia; Glidden To Mine Titanium

MAINE mineral production was largely from pegmatites with 14,500 long tons of feldspar mined, 100 tons of scrap mica and 20,000 pounds of sheet recovered, and several 10's of tons of beryl produced.

Prospecting by drilling was carried out on several sulphide deposits. Geological and geophysical work seeking sulphides was also continued.

NEW JERSEY's two iron ore mining companies operated three mines at high rates before the steel strike. These companies are the Alan Wood Steel Company and the Mt. Hope Mining Division of Shamoon Industries.

NEW YORK iron and zinc mines operated at record high levels during the first six months of the year but strikes during the last half held iron output to about the same as in 1958 and dropped zinc production from 53,014 short tons in 1958 to 33,302 in 1959. St. Joseph Lead Company's Balmat and Edwards zinc mines were closed for the year by a labor strike in August.

National Lead Company increased ilmenite and iron production from its Tahawus open pit mine and gravity-flotation-magnetic mill and sinter plant.

PENNSYLVANIA had two major iron mines and one major zinc mine in 1959. The Bethlehem Cornwall Corporation operated its underground Cornwall mine and new deep Grace mine at record rates, and produced more iron ore than in 1958, despite closing during the steel strike. The increase was due to the higher mining rate as the Grace mine production grew to designed capacity. The Cornwall mine has long been an important producer of byproduct pyrite, cobalt, copper, gold, and silver. Output of these metals declined as the mine was closed during steel strike.

Zinc production rose from 10,812 tons in 1958 to 16,246 in 1959 as New Jersey Zinc Company increased mining rate at its new Friedensville underground mine.

The Glidden Company announced plans to develop a major titanium mine near Lakewood, New Jersey. Ancient beach sands will be mined and heavy minerals concentrated by spirals with subsequent separation of ilmenite and rutile. The ore was developed by American Metal Climax, Inc. which did not choose to mine it.

NEW HAMPSHIRE's mica production was valued at \$1,185,000 in 1959; the 125,000 pounds of sheet mica at \$1,165,000 and the 650 tons of scrap at \$20,000. Sheet mica was full trimmed and was sold to the federal governments buying depots at Franklin, and Spruce Pine, North Carolina; some small sales were also made to industry.

VIRGINIA's zinc production rose 7.0 percent to 19,734 tons. The Austinville mine of the New Jersey Zinc Company was the state's largest, but substantial output was also made from the new 800-ton-per-day-Bowers-Campbell mine of Tri-State Zinc Company at Timberville.

Titanium minerals were produced by American Cyanamid Company at its Piney River mine and mill, and by Metal & Thermite Corporation's Hanover mine.

(State's Review cont. on page 98)

Production of Minerals by States*

Alaska

Mineral	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Chromite ¹	7,193	\$ 711,481	4,207	\$ 431,000				
Coal, bituminous ²	726,801	6,373,976	842,338	7,296,000	759,000	\$ 6,931,000	602,000	N.A.
Gold ³	209,296	7,325,360	215,467	7,541,000	186,435	6,525,000	171,000	\$ 5,985,000
Lead ⁴	1	314	9	3,000	2	6		
Mercury ⁵	3,280	852,539	5,461	1,349,000	3,380	774,000	3,750	852,000
Sand and gravel ¹	5,955,105	5,879,799	6,096,000	8,790,000	4,255,000	3,871,000	5,600,000	5,100,000
Silver ⁶	28,360	25,667	28,862	26,000	24,000	22,000	22,000	20,000
Stone ¹	194,864	594,894	528,000	1,953,000	615,000	2,065,000	54,000	210,000
Undistributed ⁶		1,643,937		1,390,000		1,253,000		7,698,000
TOTAL		\$23,408,000		\$28,792,000		\$21,447,000		\$19,880,000

* Estimated. 1. Short tons. 2. Fine ounces. 3. Flasks. 4. Value included with undistributed gem stones and other minerals whose value must be concealed to avoid disclosing company incomes. 5. Includes platinum. 6. Less than \$1,000. N.A. Not Available.

California

Year	Iron Ore Long Tons	Chromite Tons	Mercury Flasks	Tungsten Tons (60% WO ₃)	Boron Minerals Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	60,293	13,419	25,714	2,603	301,282	1,408,793	2,154,188	3,943	3,464	440	\$52,231,066
1942	95,107	44,873	29,906	3,483	226,723	847,997	1,450,440	1,058	5,151	613	31,771,607
1943	794,440	62,495	33,812	3,871	256,633	148,328	609,075	8,762	5,820	1,856	9,176,616
1944	845,260	34,715	28,052	3,027	277,586	117,373	778,936	12,721	5,682	8,485	10,933,495
1945	280,573	9,607	21,199	1,073	325,935	147,938	986,798	6,473	7,224	9,923	11,152,081
1946	340,491	4,107	17,782	1,262	430,689	356,824	1,342,651	4,240	9,923	6,877	18,788,664
1947	530,434	948	17,165	394	501,935	431,415	1,597,442	2,407	10,080	5,415	21,769,620
1948	153,684	274	11,188	1,767	450,932	421,473	724,771	481	9,110	5,325	20,294,093
1949	536,525	433	4,493	952	467,592	417,231	783,880	649	10,318	7,209	20,616,562
1950	831,445	404	3,850	2,025	647,735	412,118	1,071,917	696	15,831	7,551	22,081,859
1951	1,198,847	6,302	4,282	3,007	867,927	339,732	1,145,219	921	13,967	9,602	21,700,575
1952	1,516,373	14,713	7,241	2,980	583,828	258,176	1,099,658	800	11,199	9,419	17,151,792
1953	1,697,652	26,512	9,290	2,130	715,228	234,591	1,036,072	382	8,664	5,358	12,870,230
1954	1,270,292	30,661	11,262	3,089	790,449	237,886	309,575	362	2,671	1,415	9,857,265
1955	1,776,536	22,105	9,875	4,383	924,496	251,737	954,181	613	8,265	6,836	14,276,301
1956	2,414,277	27,083	9,017	3,719	568,087 ¹	193,816	938,139	859	9,296	8,049	13,487,143
1957	N.A.	34,901	16,511	1,750	541,124	170,885	522,288	945	3,458	2,969	8,701,000
1958	N.A.	20,588	22,365	(3)	528,209	185,385	188,000	749	140	51	7,096,000
1959 ²	N.A.	(3)	17,282	(3)	604,000	144,000	162,100	630	220	80	5,648,000

1. Reported as BaO content of ore; 2. Estimated by U.S. Bureau of Mines. 3. Figure withheld to avoid disclosure of company confidential data. N.A. Not available.

Montana

Year	Tungsten Conc 60% WO ₃ Tons	Manganese ² 35% or More Mn Tons	Chromite ¹ Tons	Fluorspar Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	7	43,555	—	—	246,475	12,386,925	128,036	21,259	60,710	\$ 59,181,627
1942	—	120,409	65,238	—	146,892	11,188,118	141,194	20,050	54,715	60,129,853
1943	1	130,789	75,691	—	59,586	8,450,370	134,525	16,324	37,606	53,642,648
1944	25	153,665	1,251	—	50,021	7,093,215	118,100	13,105	36,127	49,039,855
1945	—	143,888	—	—	44,597	5,942,070	88,506	9,999	17,403	35,405,505
1946	84	129,227	—	—	70,507	3,273,140	58,481	8,280	16,770	29,957,206
1947	4	123,490	—	—	90,124	6,326,190	57,900	16,108	45,679	48,890,964
1948	—	119,339	—	318	73,081	6,930,716	58,252	18,411	59,095	56,422,609
1949	9	107,399	—	422	52,274	6,327,025	56,611	17,996	54,195	49,003,447
1950	—	119,694	—	41	51,764	6,590,747	54,478	19,617	67,678	54,956,689
1951	—	91,080	—	—	30,502	6,393,768	57,406	21,302	75,888	73,149,813
1952	1	90,772	—	16,160	24,161	6,138,185	61,948	21,279	82,185	70,521,092
1953	14	113,429	26,089	5,932	24,768	6,690,000	77,617	19,949	80,271	75,162,000
1954	678	N.A.	N.A.	15,102	23,660	5,177,942	59,349	14,820	60,952	57,756,621
1955	1,211	106,026	118,703	25,223	28,123	6,080,390	81,542	17,028	68,588	89,264,689
1956	1,230	80,553	118,780	59,775	38,121	7,385,908	96,426	18,642	70,520	115,157,023
1957	661	68,298	119,149	64,339	32,766	5,558,228	91,512	13,300	50,520	76,791,951
1958	—	53,123	119,057	53,654	26,003	3,631,000	90,683	8,434	33,238	60,650,000
1959 ²	—	20,665	105,289	N.A.	26,790	3,217,000	65,490	7,520	27,560	52,527,000

1. Gross weight short tons. 2. Estimated by U. S. Bureau Mines. N.A. Not Available.

Nevada

Year	Iron Ore Long Tons	Manganese ² 35% or More Mn Tons*	Tungsten 60 Percent WO ₃ Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	241	2,937	2,289	366,403	5,830,238	78,911	9,263	15,129	\$38,959,420
1942	—	6,112	3,052	295,112	3,723,435	83,663	5,378	10,197	35,840,168
1943	7,368	10,451	2,910	144,442	1,620,280	71,068	4,790	13,647	28,351,601
1944	36,581	19,800	2,665	119,056	1,259,636	61,232	6,605	20,699	27,371,513
1945	6,196	874	1,857	92,265	1,043,380	52,595	6,275	21,457	24,186,294
1946	3,299	1,067	1,067	90,680	1,250,651	48,616	7,175	22,649	27,026,416
1947	5,452	67	2,002	89,063	1,337,579	49,603	7,161	16,970	31,566,282
1948	8,945	—	949	111,552	1,790,020	45,242	9,777	20,288	34,055,480
1949	3,094	—	740	130,399	1,800,209	38,058	10,626	20,443	29,615,777
1950	5,465	—	1,123	178,447	1,537,217	52,569	9,408	21,606	38,181,872
1951	331,327	58	1,482	121,036	981,669	56,474	7,148	17,443	41,280,596
1952	912,084	105	2,329	117,203	941,195	57,537	6,790	15,357	40,086,746
1953	444,081	20,510*	3,233	101,799	697,086	61,850	4,371	5,812	42,177,725
1954	351,250	88,220*	4,659	70,067	360,182	70,217	3,041	10,335	45,366,162
1955	324,602	102,000*	6,155	72,913	845,397	78,925	3,291	2,670	63,832,670
1956	916,592	121,482	5,400	68,040	933,716	80,824	6,384	7,488	78,154,038
1957	904,455	129,046	1,196	76,752	958,477	77,750	5,979	5,292	53,297,028
1958	594,000	127,322	(3)	105,087	932,728	66,137	4,150	91	40,300,000
1959 ¹	690,000	56,500	(3)	110,500	619,000	56,460	1,700	251	39,895,000

1. Estimated by U. S. Bureau of Mines. *Long tons. 2. Shipments to Government low-grade depots and custom mills not included. 3. Figure withheld to avoid disclosing individual company data.

*Dollar value shown only for base and precious metals unless otherwise indicated.

Idaho

Year	Phosphate Long Tons	Mercury Flasks	Tungsten Conc. 60 percent WO ₃ Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	97,274	NA	663	149,816	16,672,410	3,621	104,914	79,084	\$41,876,848
1942	115,263	NA	2,132	95,020	14,644,890	3,430	113,909	87,256	46,063,326
1943	108,916	4,261	4,878	30,808	11,700,180	2,324	96,457	86,707	43,199,910
1944	112,565	1,332	3,957	25,008	9,931,614	1,688	83,372	42,591,137	
1945	123,340	627	2,130	17,780	8,142,667	1,548	68,447	83,463	37,799,975
1946	312,658	868	641	42,975	6,491,104	1,038	59,987	71,507	37,610,123
1947	845,045	886	61	64,982	10,345,779	1,640	78,944	83,069	55,164,670
1948	434,375	543	86	38,454	11,448,875	1,624	88,544	86,267	67,758,290
1949	471,305	—	56	77,829	10,049,257	1,438	79,299	76,555	56,429,796
1950	573,044	—	222	79,652	16,095,019	2,107	100,025	87,890	70,198,647
1951	695,026	357	377	45,064	14,753,023	2,160	76,713	74,317	70,953,653
1952	620,551	887	333	32,997	14,925,165	3,213	73,719	74,317	64,626,967
1953	1,001,969	NA	441	17,630	13,636,680	2,100	69,885	68,650	47,729,814
1954	1,092,817	—	450	13,245	15,867,414	4,828	69,302	61,528	49,951,702
1955	1,329,959	1,107	642	10,572	13,831,458	5,618	64,163	53,314	49,315,034
1956	1,438,151	3,394	582	9,210	13,471,916	6,656	64,321	49,561	51,949,222
1957	1,308,742	2,260	35	12,301	15,067,420	7,912	71,637	57,831	52,735,309
1958	1,291,000	2,625	(2)	15,896	15,953,000	9,846	53,603	49,725	42,860,000
1959 ¹	1,600,000	1,987	—	9,840	16,008,000	8,820	60,640	53,530	46,938,000

1. Estimated by U. S. Bureau of Mines. NA Not available. 2. Figure withheld to avoid disclosure of company data.

Arizona

Year	Uranium Ore, Tons	Molybdenum Pounds	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	NA	315,392	7,498,260	326,317	15,638	16,493	\$ 97,638,310	
1942	"	253,651	7,064,467	393,387	14,772	18,322	114,325,600	
1943	"	171,810	5,713,889	403,181	13,727	19,677	121,212,902	
1944	"	112,162	4,394,039	358,303	16,707	29,077	113,094,806	
1945	"	77,223	3,558,216	287,203	22,867	40,226	95,963,006	
1946	"	79,024	3,268,765	289,223	23,930	43,665	114,986,254	
1947	"	95,860	4,569,084	366,218	28,566	54,644	182,752,537	
1948	"	109,487	4,837,740	375,121	29,899	54,478	196,207,948	
1949	"	108,993	4,970,734	359,021	33,568	70,658	177,894,134	
1950	"	118,313	5,325,441	403,301	26,383	60,480	201,033,694	
1951	1,172,740	116,093	5,120,985	415,870	17,394	52,999	235,289,045	
1952	2,022,832	112,355	4,701,330	395,719	16,520	47,143	220,686,278	
1953	1,446,557	112,824	4,351,429	393,525	7,092	19,613	242,572,489	
1954	1,538,088	114,809	4,298,811	377,927	8,385	21,461	237,818,952	
1955	1,497,000	127,616	4,634,179	454,105	9,817	22,684	325,928,786	
1956	2,392,000	146,110	5,179,185	505,908	11,999	25,580	453,270,137	
1957	2,385,000	152,000	5,279,000	516,000	12,000	34,000	332,082,000	
1958	257,756	2,320,000	142,979	4,685,000	485,839	11,890	273,398,000	
1959*	239,000	2,659,000	125,600	3,906,000	429,200	9,800	285,054,000	

*Estimated by U. S. Bureau of Mines. NA—Not available.

Colorado

Year	Molybde- num Pounds	Tungsten 60%WO ₃ Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	27,751,273	646	380,029	7,301,697	6,748	12,574	15,722	\$23,877,597
1942	41,852,136	380	268,627	3,096,211	1,102	15,181	32,215	19,896,623
1943	46,133,715	378	137,558	2,664,142	1,028	18,032	44,094	19,205,415
1944	23,608,421	296	111,455	2,248,830	1,048	17,698	39,995	17,724,473
1945	18,525,041	234	100,935	2,226,780	1,485	17,044	35,773	16,676,521
1946	10,816,426	213	142,613	2,240,151	1,754	17,036	36,147	19,903,509
1947	11,512,719	68	168,279	2,557,653	2,150	18,696	38,745	23,868,179
1948	13,172,094	208	154,802	3,011,011	2,298	25,143	45,164	30,155,337
1949	10,752,817	222	102,618	2,894,886	2,403	26,853	47,703	27,474,322
1950	11,903,043	196	130,390	3,492,278	3,141	27,007	45,776	29,323,268
1951	22,538,739	336	116,503	2,787,882	3,212	30,336	55,714	38,931,539
1952	23,874,408	625	124,594	2,813,643	3,606	30,066	53,203	35,997,231
1953	37,306,341	864	119,218	2,200,000	2,941	21,754	37,809	22,247,780
1954	42,544,795	927	96,146	3,417,072	4,323	17,823	35,150	21,602,205
1955	43,043,000	1,152	88,577	2,772,073	4,323	15,805	35,350	22,240,009
1956	37,489,000	873	97,668	2,284,701	4,228	19,858	40,246	26,342,138
1957	42,466,000	45	88,000	2,788,000	5,000	21,000	47,000	25,590,000
1958	25,079,000	(4)	79,539	2,056,000	4,193	14,112	37,132	17,727,000
1959 ¹	41,000,000	(4)	61,500	1,400,000	2,900	13,900	35,200	16,551,000
1956	Vanadium ²	5,582,484	Uranium Ore ³	—	—	—	—	—
1957	Vanadium ²	6,264,000	Uranium Ore ³	740,000	—	—	—	—
1958	Vanadium ²	4,791,000	Uranium Ore ³	939,706	—	—	—	—
1959 ¹	Vanadium ²	7,167,000	Uranium Ore ³	1,039,000	—	—	—	—

1. Preliminary. U. S. Bureau Mines. 2. Pounds. 3. Short Tons. 4. Figure withheld to avoid disclosure of Co. Info.

Oregon

Year	Nickel Tons*	Mercury Flasks	Chromite Tons	Gold Ounces	Silver Ounces	Dollar Value
1941		9,032	840	96,525	276,158	\$3,576,154
1942		6,936	2,683	46,233	87,376	1,680,289
1943		4,651	16,363	1,097	10,527	45,878
1944		3,159	7,818	1,369	20,243	62,310
1945		2,500	4,366	4,467	10,461	163,874
1946		1,326	NA	17,598	6,927	621,527
1947		1,185	—	18,979	30,379	691,758
1948		1,351	3,345	14,611	13,596	523,690
1949		1,167	—	16,226	12,195	578,947
1950		5	—	11,058	13,565	399,307
1951		1,177	754	7,927	6,218	283,073
1952		868	6,591	5,509	4,037	196,469
1953		648	6,216	8,250	6,930	295,022
1954	1,993	491	6,665	6,520	14,335	241,174
1955	4,181	1,056	5,341	1,708	8,815	1,07,758
1956	6,866	1,893	54,577	2,738	15,542	108,086
1957	12,276	3,993	7,900	3,381	15,724	132,747
1958	12,697	2,276	4,133	1,423	2,728	52,000
1959 ¹	12,000	1,313	—	420	100	15,100

1. Estimated by U. S. Bureau of Mines. 2. Nickel content of ore.

North Carolina

Year	Feldspar Long Tons	Tungsten Conc. (60% WO ₃) Tons
1941	183,027	1,088
1942	166,361	1,041
1943	240,364	1,254
1944	268,062	2,074
1945	230,744	2,538
1946	242,724	2,609
1947	255,637	2,732
1948	233,000	2,000
1949	N.A.	N.A.
1950	N.A.	N.A.

1. Estimated by U. S. Bureau of Mines. NA Not Available.

Oklahoma

Year	Lead Tons	Zinc Tons
1941	25,021	166,602
1942	22,806	146,510
1943	19,733	114,085
1944	13,944	91,449
1945	12,664	69,300
1946	13,697	69,552
1947	14,289	51,062
1948	16,918	43,821
1949	19,858	44,033
1950	20,724	46,739
1951	16,575	33,450
1952	15,137	34,916
1953	9,304	33,413
1954	14,204	43,171
1955	14,126	41,543
1956	12,350	27,515
1957	7,183	14,951
1958	3,692	5,267
1959 ¹	275	494

1. Estimated by U. S. Bureau of Mines.

Michigan

Year	Copper Tons	Iron Ore Long Tons
1941	46,440	15,201,619
1942	45,679	16,129,474
1943	46,764	14,510,357
1944	42,421	15,425,788
1945	30,401	11,865,624
1946	21,663	8,756,802
1947	24,184	12,965,482
1948	27,777	12,896,478
1949	19,506	11,199,024
1950	25,608	12,691,101
1951	24,979	13,779,901
1952	21,699	11,779,366
1953	24,097	14,326,074
1954	23,593	9,709,167
1955	50,066	14,143,509
1956	61,526	12,536,009
1957	58,400	13,122,875
1958	58,005	8,111,646
1959 ¹	56,415	7,475,000

1. Estimated by U.S. Bureau of Mines.

Wyoming

Minerals	1957	1958	1959 ¹
Iron ²	736,000	557,000	478,000
Uranium ³	275,000	651,790	755,000
Phosphate Rock ⁴	N.A.	124,000	177,000

1. Estimated by U. S. Bureau of Mines. 2. Long tons. 3. Short tons. N.A. Not Available.

Minnesota

Year	Long Tons	Content %
1946	49,055,340	51.48
1947	62,436,102	50.99
1948	67,923,237	49.86
1949	55,943,714	50.25
1950	64,538,759	49.37
1951	78,164,527	50.53
1952	63,906,069	50.16
1953	80,533,670	50.31
1954	48,613,338	50.94
1955	69,419,334	50.65
1956	62,637,317	51.49
1957	67,656,040	52.49
1958	42,502,226	52.63
1959 ¹	55,400,000	N.A.

1. Estimated by U. S. Bureau of Mines. N.A. Not available.

Missouri

Year	Iron Ore Tons	Lead Tons	Zinc Tons	Copper Tons	Silver Fine Ounces
1941	165,909	21,932	1,400	169,027	
1942	199,548	36,394	1,300	69,106	
1943	184,910	30,413	1,340	111,285	
1944	174,683	36,626	3,302	92,243	
1945	176,575	22,175	3,399	94,822	
1946	139,112	22,234	1,857	69,401	
1947	132,246	17,074	1,760	93,600	
1948	102,288	6,463	2,370	114,187	
1949	127,522	5,911	3,670	123,413	
1950	134,626	8,189	2,282	236,273	
1951	123,702	11,476	2,422	184,424	
1952	129,245	13,986	2,656	157,432	
1953	125,895	9,981	2,374	359,781	
1954	125,250	5,210	1,925	352,971	
1955	125,412	4,476	1,722	438,000	
1956	123,783	4,380	1,800	295,111	
1957	126,345	2,951	1,604	183,427	
1958	387,000	113,123	362	1,429	251,000
1959 ¹	325,000	105,000	—	1,550	169,000

1. Estimated by U. S. Bureau of Mines.

New Jersey, New York, Pennsylvania, and Virginia

	1957	1958	1959
New Jersey			
Zinc ⁴	12,530	607	—
Iron ⁵	876,605	(6)	(6)
New York			
Silver ⁴	64	67,000	39,000
Lead ⁵	1,667	579	344
Zinc ⁴	64,659	53,014	33,302
Pennsylvania			
Cobalt ⁶	599,122	564,362	368,266
Zinc	—	10,812	16,246
Virginia			
Manganese ⁵	12,655	8,128	8,600
Zinc ⁴	23,080	18,472	19,734
Lead ⁵	3,143	2,934	2,696

1. Estimated by U. S. Bureau of Mines. 2. Short tons. 3. Long tons. 4. Fine Ounces. 5. Pounds. 6. Cannot be Disclosed.

Florida

Year	Phosphate Rock Long Tons	Titanium Minerals Tons
1950	8,085,870	(2)
1951	8,496,831	(2)
1952	8,781,125	(2)
1953	9,331,002	178,818
1954	10,437,197	182,421
1955	8,747,282	238,500
1956	11,822,145	283,956
1957	10,191,000	263,000
1958	10,851,000	190,000
1959 ¹	11,009,000	255,000

1. Estimated by U. S. Bureau of Mines.

Wisconsin

Year	Iron Ore Long Tons	Lead Tons	Zinc Tons
1950	—	532	5,722
1951	1,745,120	1,391	15,754
1952	1,485,845	2,000	20,588
1953	1,655,331	2,094	16,830
1954	1,428,910	1,261	15,534
1955	1,886,029	1,948	18,326
1956	1,488,361	2,582	23,890
1957	1,576,057	1,900	21,575
1958	867,000	800	12,140
1959 ¹	760,000	735	11,400

1. Estimated by U. S. Bureau of Mines

New Mexico

Year	Potassium Salts K ₂ O Equivalent Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	433,677	27,845	1,328,317	73,478	4,668	37,862	\$25,471,416
1942	548,730	11,961	676,170	80,100	4,608	46,461	29,542,885
1943	604,414	5,563	463,583	76,163	5,723	59,524	34,042,378
1944	679,721	6,918	535,275	69,730	7,265	50,727	32,178,026
1945	733,176	5,604	465,127	56,571	7,662	40,295	26,386,781
1946	789,473	4,009	338,000	50,191	4,999	36,103	26,522,417
1947	880,605	3,146	515,833	60,205	6,383	44,103	88,374,269
1948	967,945	3,414	537,674	74,687	7,653	41,502	46,799,576
1949	932,497	3,249	380,855	55,385	4,652	29,346	31,029,120
1950	1,072,722	3,414	338,581	66,300	4,150	29,263	37,437,915
1951	1,217,717	3,950	443,267	73,558	5,846	45,419	54,697,048
1952	1,411,125	2,949	479,318	76,112	7,021	50,975	56,599,692
1953	1,562,831	2,614	205,000	72,477	2,943	45,725,959	
1954	1,732,240	3,539	109,132	60,558	887	6	36,196,189
1955	1,826,118	1,917	251,072	66,417	3,296	15,277	54,581,760
1956	1,930,754	3,257	392,967	74,345	6,042	35,010	75,153,458
1957	2,080,000	3,000	309,000	67,000	5,000	33,000	50,106,000
1958	1,978,000	3,378	159,000	55,540	1,117	9,034	31,580,000
1959 ¹	2,200,000	3,100	170,000	39,800	1,000	4,800	26,270,000
1958	Uranium Ore ²	1,888,499					
1959	Uranium Ore ²	3,219,000					

1. Estimated by U. S. Bureau of Mines. 2. Short tons.

South Dakota

Year	Uranium Ore	Feldspar (Crude) Long Tons	Beryllium Conc. Tons	Gold Ounces	Silver Ounces	Dollar Value
1941	—	59,015	151	600,637	170,771	\$21,143,732
1942	—	56,449	205	522,098	186,937	18,406,363
1943	—	70,913	238	106,446	35,886	3,751,059
1944	—	64,806	306	11,621	5,445	410,607
1945	—	68,374	38	55,948	26,564	1,977,070
1946	—	74,540	95	312,247	86,901	10,998,861
1947	—	58,595	70	407,194	111,684	14,359,766
1948	—	54,037	45	377,850	94,693	13,323,894
1949	—	32,272	69	464,650	109,383	16,363,011
1950	—	43,875	96	567,996	142,069	20,008,436
1951	—	48,559	138	458,101	139,590	16,159,871
1952	—	50,601	334	482,534	132,102	17,008,249
1953	—	40,163	392	534,987	138,642	18,850,023
1954	—	44,498	337	541,445	151,407	19,087,066
1955	—	42,164	294	529,865	154,092	19,109,068
1956	—	45,164	195	568,523	136,118	20,310,537
1957	—	41,000	268	568,000	135,000	20,007,000
1958	—	35,489	23,229	570,830	153,000	20,117,000
1959 ¹	—	46,000	21,000	574,000	124,000	20,202,000

1. Estimated by U. S. Bureau of Mines.

Utah

Year	Iron Ore Long Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	397,607	356,501	11,395,485	266,838	69,601	42,049	\$ 97,796,623
1942	359,558	391,544	10,574,955	306,691	71,930	45,543	113,552,848
1943	922,959	390,470	9,479,340	323,898	65,257	46,896	124,562,540
1944	1,542,284	344,223	7,593,075	282,575	52,519	38,994	111,036,247
1945	1,931,749	279,979	6,106,545	226,376	40,817	33,630	90,018,641
1946	1,317,176	178,533	4,118,453	114,284	30,711	28,292	60,202,627
1947	2,823,853	421,662	7,780,032	266,533	49,698	43,673	158,624,849
1948	3,233,413	368,422	8,045,329	227,007	55,590	41,490	149,763,677
1949	3,112,390	314,058	6,724,880	197,245	53,072	40,670	121,649,878
1950	3,139,926	457,551	7,083,808	278,630	44,753	31,678	159,431,611
1951	4,726,159	432,216	7,310,665	271,086	50,451	34,317	182,897,139
1952	4,060,003	435,507	7,194,109	282,894	50,210	32,947	185,780,497
1953	4,617,288	483,430	6,725,807	269,496	41,522	29,184	195,289,033
1954	3,040,646	403,401	6,179,243	211,835	44,972	34,031	164,367,236
1955	3,847,402	441,206	6,250,565	232,949	50,452	43,556	220,628,713
1956	4,001,734	416,031	6,572,041	230,604	49,555	42,374	260,693,260
1957	4,156,000	378,000	6,198,000	238,000	44,000	41,000	184,240,000
1958	5,514,000	307,824	5,278,000	189,184	40,355	44,982	133,681,000
1959 ¹	2,785,000	240,300	3,740,000	151,300	36,200	35,300	122,265,000
1957	Uranium Ore ²	—	1,076,000	—	—	—	—
1958	Uranium Ore ²	—	1,239,767	—	—	—	—
1959 ¹	Uranium Ore ²	—	1,183,000	—	—	—	—

1. Estimated by U. S. Bureau of Mines. 2. Short Tons.

Washington

Year	Tungsten* Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	68	84,176	402,030	8,686	3,903	13,320	\$ 7,874,886
1942	45	75,396	369,038	8,030	4,851	14,398	8,172,609
1943	4	65,244	370,440	7,365	5,022	12,203	7,838,012
1944	5	47,277	321,608	6,164	5,825	11,904	7,195,136
1945	2	57,860	281,444	5,281	3,802	11,693	7,140,242
1946	1	51,168	264,453	4,527	2,987	11,329	6,886,748
1947	—	34,965	293,736	2,240	5,259	13,800	7,313,398
1948	—	70,075	375,831	5,665	7,147	12,638	11,171,715
1949	—	71,994	357,853	5,275	6,417	10,740	9,613,307
1950	—	62,117	363,566	5,057	10,344	14,807	12,652,302
1951	9	67,405	344,948	4,089	8,002	18,189	14,030,884
1952	4	34,776	315,645	4,357	11,744	20,102	14,767,054
1953	5	62,560	321,000	3,740	11,064	32,786	15,067,000
1954	18	66,740	313,735	3,636	9,938	22,760	17,140,242
1955	12	74,360	436,348	3,958	10,340	29,536	16,297,361
1956	N.A.	70,669	448,442	1,926	11,657	25,640	16,043,542
1957	—	N.A.	N.A.	1,700	12,734	24,000	—
1958	—	N.A.	N.A.	52	9,020	18,797	5,973,000 ²
1959	—	N.A.	N.A.	30	10,310	16,960	6,340,000 ²

1. Estimated by U. S. Bureau of Mines. *Tungsten (recoverable contents of ores) 60% WO₃. N.A. Not available. 2. Copper, lead, zinc only.

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Tennessee

Year	Phosphate Rock Long Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1950	1,384,473	160	39,958	6,851	113	35,326	\$22,983,278
1951	1,419,892	108	24,960	7,069	14	38,639	28,121,844
1952	1,452,508	241	57,569	7,620	18	38,020	27,267,054
1953	1,622,170	293	68,935	7,829	9	38,465	25,666,924
1954	1,633,226	218	60,759	9,087	—	30,326	22,716,838
1955	1,465,902	221	66,619	9,911	—	40,216	27,881,089
1956	1,685,003	189	64,878	10,449	5	46,023	33,201,978
1957	1,812,000	172	54,407	9,790	—	58,063	31,933,000
1958	1,903,000	124	44,592	9,109	—	59,130	29,938,000
1959 ¹	1,854,000	110	58,694	11,312	—	87,079	40,179,000

1. Estimated by U. S. Bureau of Mines.

Kansas

Year	Lead Tons	Zinc Tons
1941	14,538	71,403
1942	9,419	55,874
1943	9,213	36,944
1944	9,394	63,703
1945	7,370	48,394
1946	6,445	47,703
1947	7,285	41,497
1948	8,386	35,577
1949	9,772	29,433
1950	9,487	27,176
1951	8,947	28,904
1952	5,916	25,482
1953	3,347	15,515
1954	4,033	19,110
1955	5,498	27,611
1956	7,635	28,665
1957	4,257	15,859
1958	1,299	4,421
1959 ¹	160	306

1. Estimated by U. S. Bureau of Mines.

Idaho

► Phosphate Mining Expansion Continues; Major Silver Strikes in Coeur d'Alenes

Silver and phosphate were bright spots in Idaho's 1959 mining picture. Lead and zinc price increases were not sufficient to bring about mine reopenings or stimulate exploration.

SILVER: This precious metal, which in 1958 replaced lead as Idaho's most valuable mineral, again held the No. 1 position and output gained for the fourth consecutive year. Idaho continued to lead all states in silver production, which totaled 16,008,000 ounces valued at \$14,488,000. Nearly all of the silver was extracted from deep mines in the Coeur d'Alene mining district, Shoshone County. Sunshine Mining Company again led the state and the nation in silver production. The Galena mine, owned by Callahan Mining Company but operated by American Smelting and Refining Company, moved into second place among Idaho silver producers. Promising new silver strikes were made in both the Sunshine and Galena mines during the year. Sunshine began preparations to deepen its workings 300 feet and open a new 4300-foot level which would be the deepest in the district—1,720 feet below sea level.

PHOSPHATE: Begun only 15 years ago, phosphate mining showed the greatest production increase—42 percent—to take over fourth place among mineral commodities from the standpoint of value. Output of crude phosphate rock totaled 2,100,000 long tons. The increase resulted mainly from expanded output at the Georgetown mine of Central Farmers Fertilizer Company. All production was from southern Idaho. Late in the year, the Bunker Hill Company started building a \$2,000,000 phosphate fertilizer plant at Kellogg.

LEAD: Tonnage recovered was up 13 percent from 1958 but still was considerably lower than the average of the pre-

ceding 10 years. A slightly higher price for lead boosted the value of production by 15 percent. The Bunker Hill mine at Kellogg, Coeur d'Alene mining region, again was the largest producer, accounting for about half the total Idaho output. Day Mines closed the old Hercules mine at Burke, and Hecla and Bunker Hill mining companies abandoned the Silver Mountain deep exploration project east of Mullan.

ZINC: Tonnage was up 8 percent and value, 20 percent. The Bunker Hill Company's Star mine in the Coeur d'Alenes was Idaho's largest producer by a substantial margin. The Page and Bunker Hill mines were other principal sources. Marginal zinc producers remained closed.

COPPER and COBALT: Output of copper declined 10 percent and cobalt production was off more than 50 percent. This resulted from refusal of the federal government to renew a contract for purchase of cobalt produced by Calera Mining Company at the Blackbird mine, Lemhi County. The company turned to milling low-grade ore, recovering only copper, gold, and silver values and letting the cobalt go into the tailing pile.

GOLD: The curtailed Blackbird mine operation was mainly responsible for a 38 percent decline in gold production to 9,840 ounces. Leading placer mine was the Gold Bar in Idaho County.

RARE-EARTH METALS: Production of rare-earth and thorium concentrates totaled 914 tons, compared with 692 tons in 1958. Most production was by Porter Bros. Corporation and Baumhoff-Marshall, Inc., in Valley County. Porter Bros. shipped 52 percent less columbium-tantalum bearing material than in 1958.

IRON: All production was from the Washington County operation of Shasta Mining Company near Weiser, Washington County. Shipments increased threefold to nearly 4,500 tons.

MERCURY: Output dropped 25 percent to 1,987 flasks. The bulk of this was produced by Rare Metals Corporation of America at its Idaho-Almaden open-pit mine in Washington County.

URANIUM: Uranium ore shipments from the Stanley area, Custer County, fell off somewhat from 1958. Most active were Vitro Idaho Minerals Corporation, Rare Metals Corporation of America, Sidney Mining Company, and Phillips Petroleum Company.

ANTIMONY: Sunshine Mining Company, Shoshone County, continued to supply most of the domestic output. The Bunker Hill Company at Kellogg started producing small quantities of high-purity antimony metal for use in transistors.

BARITE: J. R. Simplot Company, Boise, resumed mining of barite at its Sun Valley mine in Blaine County.

CLAY-SILICA: A \$1,500,000 plant for processing Latah County clays was constructed at Bovill by J. R. Simplot Company of Boise. Paper and ceramic-grade clay, silica, and mica were to be products.

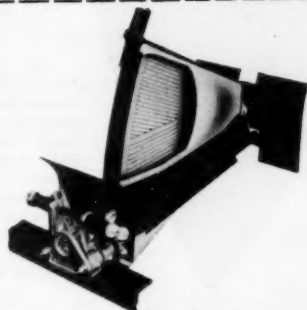
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A flexible rubber blade contours with the filter bag, as it bellows for cake discharge. Thus discharging all of the cake EVERY REVOLUTION OF THE DISC. There's no refiltered cake to produce "high moisture" lumpy cake. This means you can either increase filter capacity, or handle present tonnage at slower disc speeds . . . increase your dry time and lower cake moisture. You can even discharge thin cakes at higher disc speeds. Also because of the Contour Scraper's gentle blade pressure on the cloth and their self aligning feature, bag life is increased . . . WRITE FOR BULLETIN CS-102.

AVAILABLE FOR DISC FILTERS from 3' Dia. Discs to 12' 6" Dia. Discs



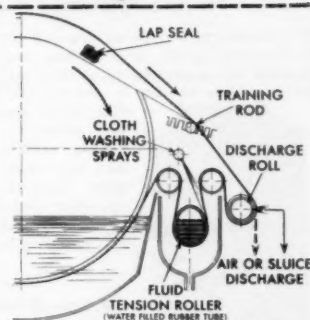
CLOTH DISCHARGE FILTER ("Cloth Discharger")

Prevents Cloth Blinding . . . Discharges Very Thin Cake

The "Cloth Discharger" continuously removes the fabric filter medium from the rotating drum, cleans it thoroughly with a solution or air jets (see left) then automatically replaces it back onto the drum, for unattended operation. A water-filled, flexible rubber tube or "Fluid Tension" roller provides uniform tension for virtually each thread of the cloth. The filter prevents internal cloth blinding. Cakes too thin for other filters are completely discharged without blow back, and fast drum cycles can reach ultimate capacity . . .

WRITE FOR BULLETIN CD-103.

AVAILABLE FOR FILTERS from 3' Dia. x 1' Pilot to 11' 6" Dia. x 18'



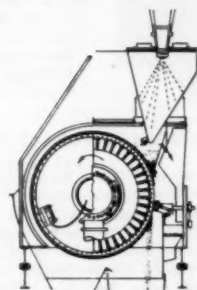
TFR - TOP FEED RESERVOIR FILTER

Top Feed Filter with a Reservoir and Overflow . . . 85% Effective Area . . . no "blow-back"

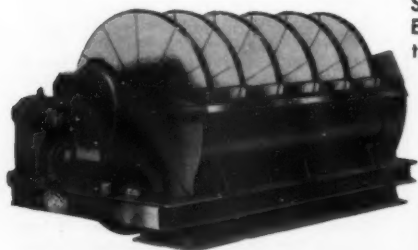
The reservoir seal is made by solids which settle in the pinch between the drum and the heavy rubber flap. A wide overflow weir can take all of the feed without overflow into the dry cake. High frequency vibration which is transmitted to the cake from a drum deck mounted in rubber, is available. The cake is discharged under vacuum by "Seal Lock" scrapers that cover and seal the narrow compartments . . . with no blow-back. The cake falls straight down and away from the drum without obstruction of additional conveying device . . .

WRITE FOR BULLETIN TFR-104.

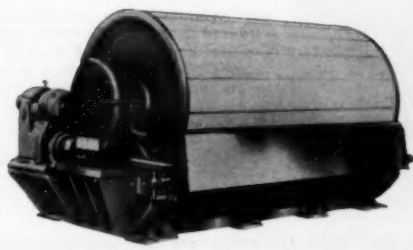
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Lake Superior

► Five New Iron Beneficiation Plants Start; White Pine Makes Important Copper Discovery

Iron ore production from the Lake Superior district during 1959 amounted to 46,691,291 gross tons. This compares to 52,868,028 gross tons during 1958 and was the lowest production figure in the previous decade.

The largest contribution to this low production figure was the 116-day steel strike which commenced July 15 and ended November 15. This strike idled almost all the United States production facilities but did not affect Canadian producers in the district.

Several new producers and plants entered the production picture during 1959. Among these were: Groveland mine and concentrator, The M. A. Hanna Company, Iron Mountain, Michigan; Canadian Charleson, Limited, Atikokan, Ontario, Canada; Steep Rock Iron Mines, Limited's north concentrator, Atikokan; Orelone Concentrating Company, Virginia, Minnesota; and Zenith Mining Company, Ely, Minnesota.

The Groveland facilities were constructed to beneficiate low grade specular hematites utilizing spirals and froth flotation in the concentrator. Canadian Charleson commenced shipment of iron ore produced by the jigging process from iron bearing gravels mined in the Atikokan area. The plant is treating ore assaying approximately 12 percent iron and produced concentrates containing 58 to 61 percent iron.

Zenith Mining Company was organized late in 1958 and reopened the Zenith mine formerly operated by Pickands Mather & Company. Zenith erected washing facilities to improve ore quality by wet processing.

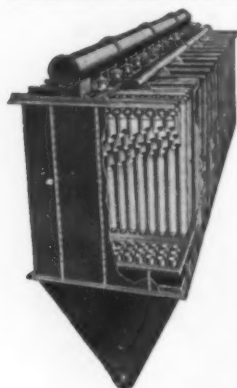
New mills under construction or contracts awarded during 1959 include the Pierce Group mine and concentrator of The M. A. Hanna Company, Hibbing, Minnesota; Sherman concentrator of Oliver Iron Mining Division, United States Steel Corporation, Chisholm, Minnesota; Humboldt Mining Company expansion by Cleveland-Cliffs Iron Company, Champion, Michigan; and the Lind Greenway mine and concentrator, Jones and Laughlin Steel Corporation, Grand Rapids, Minnesota.

Taconite concentrates contributed appreciably to the overall tonnage shipped during 1959 with Erie Mining Company, Reserve Mining Company, and Oliver Iron Mining Division mills operating at or near capacity during the year except when closed by the strike.

The opening of the St. Lawrence Seaway made possible an array of foreign ship arrivals in the Duluth-Superior harbor. Although most of these were engaged in transporting grain to foreign ports, two vessels arrived with cargoes containing German ferrosilicon for a number of iron mining companies. This material "spherical" ferrosilicon, was used as media in several coarse heavy media separation plants on the Mesabi Range.

Exploratory drilling continued in Ashland, Bayfield, Douglas, Washburn, and

(Continued on page 104)



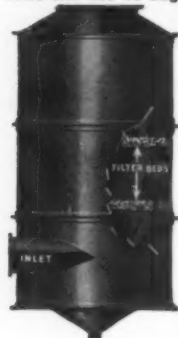
PRODUCTS: Automatic and Semi-Automatic Bag Type, H. E. L. S. Cyclone or Centrifugal Type, Hydraulic Type Dust and Fume Collectors, Cement Air Cooling System, Self-Contained or Portable Bag Type Units, Exhaust Fans . . . All designed and fabricated by our own shops.

Norblo Automatic Bag Type

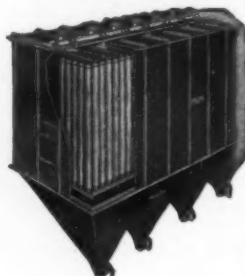
For continuous or heavy duty service providing very high efficiency at very low cost of operation and maintenance. Basic unit contains 78 bags, 6" diameter, 8' 3" long. Air flow is upward, from inside, thus keeping bags fully distended. Total free cloth area per compartment 936 square feet. Shaking and cleaning controlled by electric timer, is cyclic, one compartment at a time, each having its individual compressed air shaker mechanism and the whole system variable and adjustable for dust load without shutting down. Mechanical (electric motor) operation available. Any compartment can be cut out without affecting others. Access to interior is on the clean air side.

Norblo Standard Bag Type

For intermittent service, as fan and unit must be shut down for cleaning, usually at noon hour and end of working day. Electrical or compressed air shaking and cleaning mechanism. Basic unit has 40 bags 6" diameter, 8' 3" long, 480 square



feet cloth area. In both Standard and Automatic bag types made by Norblo, extra large hoppers provide air expansion space resulting in great drop in air velocity and a maximum degree of dust separation by gravity before passing upward for final filtering.



Norblo Hydraulic

A high efficiency, wet type collector, for separation of dust mixed with smoke or fumes. In most installations the Hydraulic unit is used with a Norblo Cyclone collector, thus reducing the amount of wet sludge to be handled. There are no moving parts. Filter beds are coke or high-fired ceramic tubes, light in weight and kept in motion by ascending air stream so that beds are self-cleaning. Built in 11 standard sizes with capacities up to 26,000 cfm.

Norblo H.E.L.S. Centrifugal

A cyclone or centrifugal type collector for all materials, from saw-dust to fly ash; characterized by high efficiency of collection with low static drop. The Norblo H. E. L. S. has no internal vanes, gadgets or dampers. High efficiency is obtained by scientific proportioning and by the patented (No. 2,259,919) expanding nozzle. These design features eliminate the power-wasting back eddy. Built in standard sizes with capacity up to 37,500 cfm.

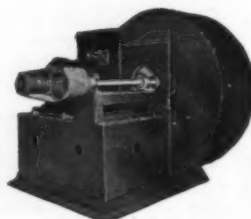


Norblo Portable Units

Self-contained units for efficient, de-centralized dust collection. Convenient, space-saving; can be located close to the dust source. Made in six sizes in bag type, with capacities from 300 to 1350 cfm. All models have 8" static at fan. Fans exceptionally quiet.

Norblo Exhaust Fans

These high speed, low power fans have been developed especially for dust collecting systems and by proper wheel selection are adaptable to all types of materials handling. All wheels are statically and dynamically balanced. Heavy duty bearings are standard equipment.



IRON ORE SHIPMENTS IN GROSS TONS FROM MINNESOTA, MICHIGAN, AND WISCONSIN BY COMPANIES AND MINES FOR 1957, 1958, AND 1959

Company Mine	1957	1958	1959	Company Mine	1957	1958	1959	Company Mine	1957	1958	1959
Cleveland-Cliffs Iron Co., The				Jessie H Mining Company				Pacific Isle Mining Company			
Athens				Jessie		121,902	123,310	Drew-Coxton-Syme	19,497	17,002	
Bunker Hill	399,854	217,414	226,215					Graham No. 2	22,896		
Cambria		33,385	22,292					Uno-Kerr Kroup	35,986		
Cambria-Jackson	176,687			Jones & Laughlin Steel Corporation				Messabi Mountain	21,583	23,006	22,930
Cliffs Shaft	670,883	421,020	402,906	Hill Annex	655,147	538,560	276,462	Iroquois-Wacoutah	371,895	347,424	493,058
Humboldt	179,185	108,912	79,357	Hill Annex Reclamation Plant	147,756	132,230		Pacific	39,753	65,969	
Lloyd	865			Longyear	417,533	258,107	200,300	Alpena L.O.S.P.	16,753	31,752	
Maas	353,683	216,154	192,420	Columbia	714,604	341,431	185,276	Bradford	17,919		
Mather	2,502,736	1,231,170	1,229,631	Missabe Mountain	76,588	81,925	209,782	Chataco	50,341	26,799	39,981
Ohio	116,701			Schley	80,323	198,280	198,264	Holland	14,495		
Tilden	192,573 ¹	81,079	167,046	Pettit	549,375	282,802	233,864	Mississippi	83,914		
Agnew-Alworth	724			Schley Group				Albany	2,335		
Canisteo	467,297	562,483	346,549	Stockpiles		64,521		Wyoming		2,542	205,428
Hawkins	668,667 ²	404,280 ²	366,438 ²	Tracy		350,723		Mill		696	
Hill-Trumbull	690,838	33,281	310,192	Nassau			117,718	Ernie		7,754	
Holman-Cliffs	912,243	809,645	467,648	Leetonia			38,097	Commodore			
Sally	303,960	278,859	176,753					Group	148,172	127,219	5,885
Sargent	76,629			Total Shipments	2,641,326	2,248,579	1,459,763	DM & IR			
Wanless	160,625	16,010						L.O.S.P.	2,948	1,046	
Marquette Ore Co.				W. S. Moore & Company				Meadow-Meadow			
Pellets	226,335	518,361		Margaret	20,455			Annex	94,722	81,143	206,866
Republic			397,519 ²	Judson	38,459	5,668	9,538	Shada	20,892		
Total Shipments	8,100,485	4,932,053	4,384,966	Stubler	3,287			St. Paul	126,201	61,378	3,677
Erie Mining Co.				Norman	13,141	42,807	10,782	Sidney		4,865	1,090
Erie	265,172	2,691,482	4,088,155	Gilbert	2,422			Stevenson			
M. A. Hanna Company				Alice	30,015			Victoria	24,975		
Cannon	731,903	610,358	450,232	Graff	3,991			Winifred	26,005		
Hiawatha	661,551	425,918	355,249	Mariska	243,559	158,882	160,242	Wisstar	5,380		28,580
Homer	552,842	276,083	360,116	Judson Extension	96,744	14,376	42,625	Mangan	145,963	43,854	68,013
Wausica	594,936	570,106	360,330	Extension	5,349			Zontelli Fee		134	
Bray	378,789	277,544	205,675	Total Shipments	457,422	221,733	223,187	Manuel-West			
Gordon	611,483	552,773	335,774					Airport	75,156	126,085	67,468
Mesabi Chief	25,694	23,654	63,479	North Range Mining Company				Merritt	833	15,032	28,117
Mississippi #3	129,521	297,701	145,723	Champion	172,029	123,973	117,225	Seth Chandler	3,464		
Stein	332,547			Book	100,409	32,854		Wakefield	140,824	15,822	
Enterprise	728,037	455,067	223,237	Warner	160,251	69,535		Meress	49,360		9,160
Brunt	2,835	948		Leonidas	202,125	152,747	79,769	Badger			34,909
Buckeye	71,871			Penokee	514,059	103,178	189,559	Total Shipments	1,564,211	1,000,264	1,218,326
Impro "B"	2,882			Zenith			139,155				
Norpac	12,917			Total Shipments	1,148,873	482,287	525,708	Pickands Mather & Company			
Argonne Leach	373,156	345,802	226,481					Zenith	384,924	170,046	
Douglas	123,771	13,297	136,862	Oglebay, Norton & Company				Embarrass	726,603	426,242	282,332
Duncan	336,060	66,103	89,481	Montreal				Albany	370,927	175,492	
Carl No. 2	669			(Montreal Mng. Co.)	929,998	450,282	353,032	Scranton	459,095	301,721	161,639
Perry	216,966			St. James				Mahoning	1,774,937	651,619	325,195
Harrison	25,827	2,675	3,078	Mng. Co.	433,318	177,509	66,967	Carmi	356,870		
North Harrison	6,209			Canton				Bennett	468,322		185,456
Harrison B	114,144			(St. James Mng. Co.)	650,956			Danube	606,264	254,078	244,415
Halobe	140,667	34,726	20,854	Total Shipments	2,014,272	627,791	419,999	West Hill	665,642	31,314	8,598
Quinn	23,900	22,717	1,338					Toga No. 2	742,499	674,691	358,745
Olson—Lot No. 1	172,334	272,962	45,942	Oliver Iron Mining Division				Rabbit Lake	303,437		136,895
Wyman	64,146			Pioneer U. G.	766,077	747,997	483,700	Mahnomena	401,013	189,341	118,150
Patrick	691,706	622,066	456,931	Soudan	157,405	161,292	117,157	Sagamore	124,858	23,496	91,370
Patrick Annex	138,780	234,708	122,184	Rouchleau				Cary	603,206	416,788	303,743
Kevin	47,578	41,313	19,464	Group (incl. Sundry)	7,254,255	5,055,829	4,123,771	Newport	487,055	341,614	260,319
Aromac	94,459	47,280		Spruce Group	579,740			Peterson	561,562	402,316	295,186
Wegum	266,710	280,474	69,676	Canton	651,746		160,556	Geneva	558,340	268,604	315,191
Wegum So.	34,770	20,148	56,823	Pilotac	664,243	732,876	618,355	Anvil-Palms			
South Agnew	669,999	123,692	97,422	Gilbert	2,296,539		349,215	Keweenaw	128,597		
Agnew No. 2	404,162	233,845	123,857	Hull-Rust Group	2,592,036	896,912	298,147	Sunday Lake	439,114	265,308	190,330
Morton	376,066	307,897	242,055	Sherman Group	5,951,165	3,281,798	2,841,516	Buck Unit	390,084	182,684	223,278
Feigh	120,599	92,388	19,411	Monroe Group	3,147,100	2,386,602	1,734,100	Fortune Lake	139,274	2,290	
Huntington	6,718	13,606	92,255	Pillsbury	258,386			Cornell	19,901		6,604
Hillcrest-South	86,250	4,542	6,135	Kosmerl Group	758,676	221,621	244,463	Volunteer	88,891	41,741	110,351
Cuyuna Fee	193,878	161,304	18,254	King	1,135,029	117,038	246,132	Total Shipments	11,066,587	4,819,285	7,706,152
Section 6	11,102	54,359		Meadow Ext. (Pittsburgh Pacific)		15,636	6,405	Pioneer Mining Company			
Portsmouth	512,360	285,563	37,118	Hanna-Wacoutah				Mary Ellen (Conc.)	151,605	67,698	94,580
Spring Valley	300,579	175,444	490,955	"B" Stockpile				Republic Steel Corporation			
Alstead	111,237	49,297	68,038	Pillsbury-Brown		637		Susquehanna	604,336		341,435
Rowe	15,105			(Douglas)	25,067			Tobin Group	144,085		76,664
West Alpena	11,644	1,907		Plummer	2,106,724	1,646,836	1,026,625	Total Shipments	748,421		418,079
Snyder		9,455	2,755	Morris Group	504,619			Reserve Mining Company			
Campbell D	10,728	18,618		Niles (Douglas)	64,250			E. W. Davis			
Hunner	1,297,172	962,977	667,515	Arcturus Group	1,240,543	673,581	780,619	Works Taconite	5,018,565	5,082,784	3,603,602
Hunt	362,802	76,880		Mariska				Pellets			
South Eddy	529,155	513,513	210,588	Extension	32,059			Rhude & Fryberger Company			
Musser		37,103		Leonidas	341,059			Boeing	268,263	165,812	126,791
Alpena-East	95,360	92,079	66,004	Union L. O.				Troy	151,418	80,009	49,619
Gray Reserve	53,776	9,863		Stockpile	13,110			Pennington	30,843		47,832
Gray Annex	14,032	25,129	71,863	Hopewell	110,251	64,060		Carlson-Nelson	69,741		4,744
Groveland			143,111	Canton				Pearshall		95,197	134,174
Gordon-Annex			46,024	(St. James)	650,956	148,585	160,556	Brown		16,386	
North Uno			293,558	Stephens	2,163,954	2,027,711	1,987,951	Alworth			15,705
G-10			140,087	Embarrass	8,600			Total Shipments	520,265	357,404	378,865
Mace No. 2			7,828	Iron Range				Snyder Mining Company			
Robert			229,239	Reserve (Jones & Laughlin)			48,804	Webb-Sellers	418,662	252,897	143,167
Total Shipments	12,882,384	8,888,951	6,860,074	Total Shipments	33,473,559	18,239,011	15,067,516	Whiteside	377,867	136,172	74,486
Halcyon Young Mining Company & E. A. Young, Inc.								Godfrey	226,776	156,359	224,390
Minnewas	71,758	59,822	37,081					Total Shipments	1,023,305	545,428	442,043
Elbern	86,196	57,175	36,516					1. Includes 546 tons left in Upper Lake port dock at close of 1956 season. 2. Does not include 1957-43,806 tons or 1958-450,541 tons Harvester's Hawkins T. B. fines. 3. Includes 100 tons lost in transit. 4. Does not include 2,691 tons International Harvester's Hawkins T. B. fines. 5. Armour No. 2 production hoisted from Armour No. 1 shaft. N.A. Not available.			
Grant	1,306	968									
Total Shipments	147,324	87,471	73,597								
Inland Steel Company											
Armour No. 1	173,915	171,105	42,316								
Armour No. 2	108,915 ²	145,299	117,068								
Morris	295,654	335,197	193,261								
Greenwood	40,256	83,188	40,458								
Sherwood	452,088	471,358	286,543								
Bristol	353,280	339,941	215,853								
Total Shipments	1,424,108	1,548,088	896,499								

SHORT TONS OF ORE MINED AND SHORT TONS OF WASTE STRIPPED AT REPRESENTATIVE OPEN PIT MINES IN THE U.S. IN 1956, 1957, 1958, AND 1959

Mine	Company	1956		1957		1958		1959	
		Ore Mined	Waste Stripped	Ore Mined	Waste Stripped	Ore Mined	Waste Stripped	Ore Mined	Waste Stripped
Utah Copper	Kennecott Copper Corporation	32,321,100	30,657,533 ¹	30,919,900	32,300,817 ¹	24,086,800	41,094,400	19,673,100	50,928,000
Morenci	Phelps Dodge Corporation	16,794,287	37,788,263	14,767,611	32,608,512	13,039,187	26,899,850	10,513,023	18,930,001
Peter Mitchell	Reserve Mining Company	—	—	15,512,478 ⁴	—	13,150,000 ⁴	1,290,000 ¹	10,200,000 ⁴	908,000 ¹
New Cornelia-Ajo	Phelps Dodge Corporation	10,112,434	14,504,201	1,813,134	14,014,755	7,711,440	13,691,784	9,823,514	15,059,850
Berkeley	The Anaconda Company	2,132,000	15,402,000	4,891,805	18,197,614	6,923,272	11,721,470	5,529,256	10,462,860
Inspiration	Inspiration Consolidated Copper Co.	—	—	4,456,378	8,156,872	4,621,091	5,462,587	5,378,848	3,993,262
Chino	Kennecott Copper Corporation	8,000,001	14,215,786	7,410,927	13,256,722	5,532,713	10,578,498	4,492,287	8,313,840
Eagle Mountain	Kaiser Steel Corp.	2,649,892	4,108,568	2,635,000 ⁶	6,491,000	3,109,859	7,323,280	3,564,558	9,820,082
Yerington	The Anaconda Company	4,500,000	N.A.	4,004,413	5,491,522	3,996,425	4,044,255	4,319,877	3,883,327
Lone Star	Lone Star Steel Co.	—	—	3,266,376 ⁶	549,195 ¹	1,753,462 ²	260,339 ¹	3,577,355 ⁶	733,762 ¹
Liberty	Kennecott-Nevada Mines Division	2,369,114	719,378	2,710,093	1,177,977	3,013,234	8,384,545	3,472,813	8,726,254
Benson	Jones & Laughlin Steel Corporation	3,761,301 ¹	4,263,050 ⁴	5,110,679 ¹	4,424,289 ⁴	3,964,544 ²	2,824,541 ³ 376,455 ⁵	3,419,966 ²	2,420,167 ³ 390,825 ⁵
Esperanza	Duval Sulphur & Potash company	—	—	—	410,342	—	6,217,886	3,216,383 ⁸	6,545,400
Tenoroc	Smith-Douglas Co.	—	—	3,804,000	4,966,283	3,350,000	6,090,000 ¹	3,200,000	5,526,000 ¹
Lavender	Phelps Dodge Corporation	5,069,049	6,463,378	4,440,768	5,968,164	4,027,522	4,423,439	3,169,701	4,772,791
Copper Cities	Miami Copper Co.	4,167,147	3,869,132	3,482,482	3,037,708	2,768,390	2,103,268	3,060,575	1,809,488
Ray	Kennecott Copper Corporation	5,852,742	N.A.	4,991,608	11,038,562	4,311,334	9,912,120	2,998,888	7,419,324
Round Mtn	Round Mountain Gold Dredging Corp.	—	—	—	—	2,198,809	N.A.	2,895,462	1,076,675
Silver Bell	American Smelting & Refining Company	2,738,650	8,771,600	2,832,600	5,141,480	2,748,600	3,342,060	2,776,400	1,602,610
Bagdad	Bagdad Copper Corp	1,361,870	5,909,888	1,479,034	3,743,300	1,663,611	6,343,597	1,770,138	6,440,208
Pima	Pima Mining Company	—	8,849,000 ¹	1,094,559 ⁶	3,052,201 ²	1,098,742 ⁶	3,120,835 ¹	1,200,606 ⁶	2,618,804 ¹
Desert Mound	Columbia Iron Mining Company	1,253,000 ⁴	995,001 ¹	1,274,000 ⁴	1,327,000 ¹	1,593,371	1,367,000 ¹	1,144,292	1,143,000 ¹
Gay	J. R. Simplot Co.	755,000	888,615 ¹	482,648	1,321,850 ⁴	1,045,200	1,893,000 ¹	1,109,700	2,668,000 ¹
Orange Park	American Cyanamid Company	—	—	—	521,195 ⁴	905,460 ⁶	10,487,412 ¹	1,051,979 ⁸	13,555,018 ¹
Nickel Mtn	Hanna Mining Company	551,656	—	1,016,596	—	1,000,100	—	1,000,200	—
Veteran	Kennecott-Nevada Mines Division	709,136	10,607,535	1,638,249	10,409,322	2,338,030	2,892,335	887,758	118,059
Saline County	Reynolds Mining Corporation	496,698	1,519,724 ¹	135,230	789,021 ¹	575,189	753,675	824,096	1,765,399
Sydney	American Cyanamid Company	—	—	—	410,342	717,289 ⁶	8,738,592 ¹	784,849 ⁶	12,785,763 ¹
Iron Mtn	Columbia Iron Mining Company	1,267,000 ⁴	911,000 ¹	1,319,000 ⁴	1,401,000 ¹	1,221,833	1,186,000 ¹	778,754	582,000 ¹
Bauxite	Aluminum Company of America	—	—	—	—	455,162 ²	—	596,334 ²	—
Pauway #4	W. R. Grace & Co., Davison Chemical Divn.	2,315,900 ²	2,683,000	1,979,800	3,219,000 ¹	578,000 ²	—	562,000 ²	—
Trace Elements	Union Carbide Nuclear Company	—	—	—	—	372,926	973,083	399,823	5,009,532
Comstock	Colorado Fuel & Iron Corporation	—	—	—	—	394,426 ⁴	—	372,171 ⁴	—
Bonny Lake	W. R. Grace & Co., Davison Chemical Division	1,298,300 ²	5,540,100	1,806,000	4,010,900 ¹	1,222,600	2,734,500 ¹	366,020 ²	N.A.
Lucky Mc	Lucky Mc Uranium Corporation	—	—	32,081	1,911,683	324,465	5,296,955	348,963	6,764,085
Buena Vista	Mineral Materials Company	—	—	—	—	253,104	—	302,122	—
Alice	The Anaconda Company	—	—	95,340	43,038	11,279	1,853,389	297,881	3,395,354
B. O'Neal	Basic Incorporated	—	—	211,000	570,000 ¹	153,000	334,000	297,719	403,440
Russellville #15	U. S. Pipe & Foundry Company	—	—	—	—	7,849	—	177,082	—
Sateco	Vitro Minerals Corporation	—	—	—	—	68,214	509,085	174,446	1,406,079
Conda	J. R. Simplot Co.	—	—	—	—	N.A.	N.A.	167,100	589,000 ¹
Blowout	Colorado Fuel & Iron Corporation	—	—	—	—	129,147 ⁴	—	163,724 ⁴	—
Midnite	Dawn Mining Company	—	—	—	—	191,265	—	130,506	—
Anderson Pit	Montana Phosphate Products Co.	116,038	491,402 ¹	117,000	340,000	118,817 ⁹	348,862 ⁵	120,378 ⁹	345,416 ⁵
Brick Flats	Mountain Copper Co. of California	—	—	—	—	93,000	880,000	104,000	1,050,000
Bouse	Sunshine Mining Co.	—	—	—	—	73,105	190,126	96,470	N.A.
Hulla	Manganese Inc.	—	—	—	—	—	—	96,020	577,570
Siskon	Siskon Corporation	—	—	—	—	63,887	N.A.	89,223	N.A.
Tripp	Kennecott, Nevada Mines Division	—	—	—	—	42,109	—	38,471	—
Thomas	Nevada Iron Ore Co.	—	—	—	—	30,000	60,000	30,000	60,000
Duncan	Colorado Fuel & Iron Corporation	—	—	—	—	89,864 ⁴	—	25,427 ⁴	—
Sun Valley	J. R. Simplot Co.	16,277	30,900 ¹	48,957	44,412	—	—	25,000	27,000 ¹
United Perlite	United Perlite Corporation	—	—	—	—	—	—	6,716	—
Elgin	McFarland & Hullinger	—	—	—	—	—	—	5,114	—
"A" Pit Ext.	Manganese, Inc.	—	—	—	—	118,740	984,440 ⁴	4,530	—
Blue Bell	McFarland & Hullinger	—	—	—	—	—	—	3,293	—
Mission	American Smelting & Refining Company	—	—	—	—	—	—	—	1,654,650
Centennial	J. R. Simplot Co.	86,909	179,740 ¹	114,054	239,885	95,137	346,530	—	—

1. Cubic yards. 2. Long tons. 3. Gross tons rock. 4. Gross tons. 5. Cubic yards surface. 6. Net tons. 7. Gross tons crude. 8. Wet. N.A. Not Available.

SHORT TONS OF ORE MINED AT REPRESENTATIVE UNDERGROUND MINES IN THE UNITED STATES IN 1954, 1955, 1956, 1957, 1958 AND 1959

Mine	Company	1954	1955	1956	1957	1958	1959
Climax	Climax Molybdenum Co. Div., American Metal Climax, Inc.	8,709,900	9,227,700	9,929,000	10,550,000	6,363,620	9,091,544
San Manuel	San Manuel Copper Corp.	—	459,726	5,496,328	8,825,130	11,486,300	7,595,867*
Southeast Missouri	Bethlehem Lead Co.	5,738,700	4,994,221	5,972,884	6,038,785	5,490,653	5,291,123
White Pine	White Pine Copper Co.	—	—	—	—	4,229,611	3,967,751
Butte	The Anaconda Company	—	—	—	—	—	—
Copper ore		3,701,677	5,211,401	6,017,000	630,201	533,416	354,637
Kelley ore		—	—	—	4,325,263	3,034,952	2,459,924
Zinc ore		915,134	1,091,862	1,094,000	650,904	307,882	324,680
Manganese ore		370,288	388,609	420,074	430,906	358,290	193,045
Special waste (Cu)		—	—	—	131,288	27,018	65,509
TOTALS—The Anaconda Co.		4,987,099	6,691,872	7,531,074	6,168,562	4,261,658	3,397,795*
Homestake	Homestake Mining Co.	1,485,226	1,550,116	1,627,719	1,659,705	1,725,081	1,746,244
Cornwall	Bethlehem Cornwall Corp.	—	1,737,610 ¹	1,381,281 ¹	1,596,088 ¹	1,568,514 ¹	1,168,468 ¹
Calumet Division	Calumet & Hecla, Inc.	1,939,329	1,406,671	2,060,849	1,731,385	1,598,173	1,564,146
Tennessee mines	American Zinc Co. of Tennessee	—	—	—	—	—	—
Mascot #2		533,318	466,962	485,959	488,394	499,495	489,778
Young		—	16,920	222,515	359,415	446,193	568,384
Coy		—	—	—	21,396	31,353	92,355
No. Friends Stn.		173,938	118,906	106,504	114,655	78,218	74,863
Athletic		8,747	25,339	17,239	—	—	—
TOTALS—American Zinc Co. of Tennessee		758,519	781,975	1,013,663	1,166,458	1,005,259	1,185,380
Pyne	Woodward Iron Co.	—	—	—	768,457	791,427*	917,718*
Westvaco	Intermountain Chemical Co.	—	—	596,753	672,000	618,000	803,000
East Side	Pend Oreille Mines & Metals Co.	—	—	587,891	757,197	607,695	619,779
Ambrosia Lake	Kernac Nuclear Fuels Corp.	482,052	503,391	—	—	119,000	479,000
Area (6 mines)		—	—	—	—	—	—
Bunker Hill	Bunker Hill Company	411,900	528,833	531,334	512,934	352,575	445,369
Sunrise	Colorado Fuel & Iron Corp.	492,304 ¹	838,692 ¹	725,496 ¹	786,548 ¹	498,521 ¹	442,347*
All mines	Homestake-Sagin Partners	—	—	363,300	304,380	88,650	414,603
Shullsburg	Eagle Picher Co.	—	—	200,000	207,427	364,305	379,489
Graham	Eagle Picher Co.	—	—	—	—	430,758	377,907
Copper Queen-Bisbee	Phelps Dodge Corp.	600,320	546,001	632,088	630,068	499,257	373,395
Idarado	Idarado Mining Co.	267,250	274,550	480,000	457,850	382,100	369,050
Balmat	St. Joseph Lead Co., Edwards Divn	551,320	539,530	548,167	551,299	469,652	367,279
Dysart #1	Rio de Oro Uranium Mines Inc.	—	—	18,391	131,000	244,272	365,553
Iron Mountain	Ozark Ore Co.	—	—	—	438,335	413,981	345,642
Uranium Area	Union Carbide Nuclear Co.	—	—	—	—	230,304	296,328
Madison	National Lead—St. Louis S & R Division	—	293,782	355,782	354,764	231,565	287,878
Magma	Magma Copper Co.	463,915	458,488	453,683	442,134	391,084	276,387
Mines	American Zinc, Lead & Smelting Co.	—	—	—	—	—	—
Grandview		113,502	194,999	209,089	228,352	231,515	236,273
Nellie B Divn		880,265	971,175	361,872	148,879	—	—
Vinegar Hill Divn		—	45,912	145,231	91,252	—	—
Piquette Joint Venture		—	54,046	96,491	91,181	—	—
TOTALS—American Zinc, Lead & Smelting Co.		993,767	1,266,133	812,683	559,664	231,515	236,273
Sunshine	Sunshine Mining Co.	250,698	225,883	200,028	206,385	231,964	234,548
Mouat	American Chrome Co.	—	—	234,346	251,323	250,166	219,390
Star ²	Hecla Mining Company	216,877	216,471	189,821	206,385	184,552	218,239
Anderson	Montana Phosphate Products Co.	325,000	294,971	170,689	172,000	184,647	186,342
Saline County	Reynolds Mining Corp.	—	180,181	151,874	162,943	121,704	163,190
Far West Shaft	Hidden Splendor Mining Co.	—	—	—	—	147,618	152,203
Marquez	Calumet & Hecla, Inc. Uranium Division	—	—	—	—	81,225	139,074
Big Buck	Standard Uranium Corp.	—	96,538	133,259	94,334	100,748	128,979
Cord	Jen, Inc.	—	—	—	—	118,215	120,700
Galena	American Smelting & Refining Co.	—	56,489 ³	87,925	123,129	119,822	117,785
Slick Rock Area	Union Carbide Nuclear Co.	—	—	—	—	80,915	114,335
Page	American Smelting & Refining Co.	132,656	76,831 ³	109,586	128,751	117,411	111,405
Mine	United Park City Mines Co.	—	—	—	—	106,382	104,673
Edwards	St. Joseph Lead Co., Edwards Divn.	—	—	121,788	121,648	104,694	79,687
Old Dick	Cyprus Mines Corp.	—	—	—	—	76,111	76,111
Mi Vida	Utex Exploration Co.	—	—	—	102,556	82,221	73,949
Daisy	Banner Mining Co.	—	60,097	76,002	90,117	101,033	73,024
Radon	Hecla Mining Co.	—	3,506	53,605	62,142	68,399	69,098
Section 32	Homestake Mining Co. (Homestake-New Mexico Partners)	—	—	—	—	43,124 ⁴	68,442
Sloss	U. S. Pipe & Foundry	—	—	—	—	153,110	67,658
Fluorspar	Aluminum Co. of America	—	—	—	—	63,220	67,373
Ike Shaft	Hidden Splendor Mining Co.	—	—	—	27,915	65,953	60,825
Hauber	Homestake Mining Co.	—	—	—	—	7,870	56,670
Columbia	Hidden Splendor Mining Co.	—	—	—	3,592	52,504	49,870
Minerva #1	Minerva Oil Co.—Fluorspar Division	48,272	70,651	66,771	88,296	86,021	48,880
Cordero	Cordero Mining Co.	—	—	—	35,156	35,714	45,845
Coeur d'Alene District	Day Mines, Inc.	—	—	—	—	55,504	45,753
Misers Chest	Banner Mining Co.	—	83,084	84,771	82,984	7,425	44,846
New Idria	New Idria Mining & Chemical Co.—Quicksilver Division	43,282	36,236	22,517	37,102	43,941	41,172
Mayflower	New Park Mining Co.	—	—	—	60,167	43,802 ⁵	39,892
Radium King	Hidden Splendor Mining Co.	—	—	—	—	36,366	39,297
Hogan	Four Corners Exploration Co.	—	—	—	—	—	36,144
Ajax	Golden Cycle Corp.	—	—	—	—	28,486	34,994
Crystal Group	Minerva Oil Co.—Fluorspar Division	—	9,746	93,320	85,548	94,252	31,826
Lovitt	Lovitt Mining Co., Inc.	—	—	—	68,909	62,972	31,810
Polaris	Hecla Mining Co.	—	—	50,806	50,304	48,393	29,422
Orphan	Western Gold & Uranium, Inc.	—	—	—	4,013	12,228 ⁷	26,417 ⁷
Temple Mountain	Union Carbide Nuclear Co.	—	—	—	—	21,536	55,472
Crescent	The Bunker Hill Co.	—	10,681	2,411	12,032	21,038	24,934
Dog	Four Corners Exploration Co.	—	—	—	—	13,357	24,000
Atkinson Mesa	Golden Cycle Corp.	—	—	—	—	20,059	20,421
Schwartzwalder	Denver-Golden Corp.	—	—	—	—	9,771	19,596
Johnson Camp	McFarland & Hullinger	—	—	—	—	—	14,884
Pack Rat Group	New Idria Mining & Chemical Co.—Uranium Divn.	—	—	—	6,445	14,261	13,481
Jack Walte	American Smelting & Refining Co.	9,532	6,478 ⁸	7,253	9,689	9,616	13,248
San Xavier	McFarland & Hullinger	—	—	—	—	25,559	12,047
Mineral Hill	Banner Mining Co.	—	97,464	107,334	51,868	20,957	10,345
Heald Property	Lucky Mc Uranium Corp.	—	—	—	—	—	3,980
Johnnie Mae Grp.	New Idria Mining & Chemical Co.—Uranium Divn.	—	—	—	—	488	1,962
Minnesota-Hi	Kennecott-Nevada Mines Divn.	—	—	390,175	721,237	67,930	—
Songo	Woodward Iron Co.	—	—	—	166,215	24,585*	N.A.
Mine LaMotte	St. Joseph Lead Corp.	—	—	—	476,292	204,883	—

* Estimated. 1. Net tons. 2. Mine owned by Bunker Hill Co. 3. Production cut by 5. mos. strike. 4. Wet. 5. Mine placed on lease Oct. 1957. 6. Gross tons. 7. Dry tons. 8. Production down due to Aug.-Dec. 1959 strike. N.A. Not available.

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(Continued from page 100)

Burnett counties of northern Wisconsin. Jones and Laughlin Steel Corporation; Ashland Mining Company; Snyder Mining Company; and Bear Creek Mining Company, a subsidiary of Kennecott Copper Corporation, were all actively prospecting these areas. The Wisconsin legislature had a bill before it to allow mining firms to divert water from lakes and streams in Ashland County for taconite processing in the Butternut, Wisconsin, area.

Copper mining in the Upper Peninsula of Michigan was conducted by Calumet and Hecla, Inc., White Pine Copper Company, Copper Range Company, and Quincy Mining Company.

Calumet and Hecla mined ore from the Seneca, Allouez, Osceola No. 13, Centennial, and two Ahmeek shafts. The famous Ahmeek No. 3 shaft was declared mined out and will no longer be a source of ore for the company. The Tamarack reclamation plant continued to operate on old mill tailings dredged from Torch Lake.

White Pine Copper Company changed mining methods for its ore body during 1959 and mined the full column height instead of the previous method of mining the parting shale. The company was struck by the United Steelworker's union on October 28 with the strike continuing to the end of the year.

Copper Range Company operated its concentrator and smelter at Freda, Michigan, on the south shore of Lake Superior.

Quincy Mining Company reopened its concentrator and smelter at Mason and Ripley, Michigan, early in 1959. These facilities were closed down in 1958 because of the depressed copper market.

Copper exploration by White Pine resulted in the discovery of a substantial ore body adjacent to the present mining area. Further diamond drilling was being conducted to completely evaluate the extent of the deposit.

Bear Creek Mining Company sought to lease 5,200 acres of state-owned land in Porcupine Mountains State Park near Silver City, Michigan. Bear Creek planned to explore and mine the copper ores and even considered exploration and mining of the ore body under Lake Superior. Public opposition from southern Michigan forced it to withdraw the request.

Iron ore producers in the Lake Superior district are faced with many problems which bear serious investigation. The competition provided by foreign ores is continually increasing. The vast projects of United States companies in eastern Canada, namely Quebec Cartier, Carroll Lake, and Wabush, coupled with Venezuelan, Brazilian, and Peruvian sources of supply, seriously threaten the future of the Lake Superior district.

Continuous research and the development of new processes to produce higher grade concentrates is a definite requirement for the operators in the Lake Superior district.

Montana

► Two New Pilot Plants Offer Hope For Chromite Sales; Iron, Uranium, and Aluminum Output Rises

Again in 1959, total mineral production in the non-fuel minerals decreased

over the previous year's production. The main reason for this was that the large producing properties of the Anaconda Company and the American Smelting and Refining Company were closed down because of a strike sponsored by the International Union of Mine, Mill and Smelter Workers of America. Most of the plants were shut down on August 19, and except for late year openings of the smelters of both companies, production was at a standstill from that date on. Closed smelters, for the most part, curtailed production of the few small producers. However iron ore production increased substantially during the year, and the future looks bright for this ore. With increasing metal prices at the year's end, the future looks much brighter for the base metals also.

Aluminum production increased slightly during 1959 because of increased production at the Columbia Falls plant of the Anaconda Aluminum Company. Work is still progressing on the economic and technologic feasibility of utilization of Idaho clay deposits as an alumina source for this plant by this company and the parent Anaconda Company.

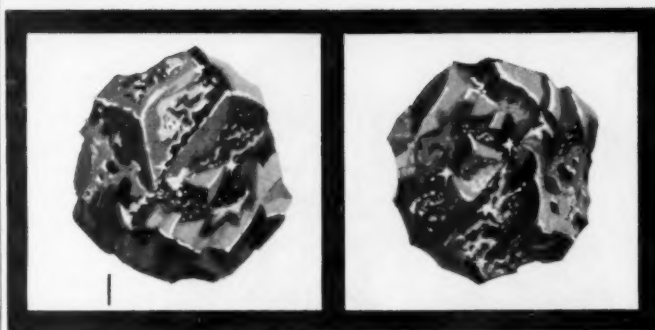
Chromium production decreased slightly when the American Chrome Company reduced mining operations from a six-day to a five-day operation at its Mout mine. The government chrome-purchase quota is scheduled to be filled by December 31, 1961. A pilot plant producing ferrochrome was operated by the company during the year and some ferrochrome was shipped to eastern steel mills. A sodium bichromate pilot plant was installed and operated by Mout Industry Inc. at Columbus. The ore came from a stockpile at the Benbow mine, and the product was shipped to the Atomic Energy Commission.

Copper, lead, zinc, silver, and other minor metals production was all affected by the strike. Production figures were all down. The Anaconda Company indicated that the marginal producing mines, i.e. cost versus profit, would not be opened after the strike. Anaconda plans on emphasizing operations at the Berkeley pit in an effort to keep production costs in line.

Gold output remained practically constant, but some outlying properties contributed to the state's gold production. The Mayflower mine near Whitehall was in production and at year's end, a flotation mill primarily for gold recovery was put into operation at the Marietta mine near Townsend by the Northern Milling Company. The floating dredge on Prickley Pear Creek near Jefferson City suspended operations about the middle of 1959.

Iron ore production increased to 50,000 long tons from the 1958 production of 13,583 long tons. The principal producer was the Young-Montana Corporation from its mines near Stanford. From the mines, the ore was shipped by truck and rail to Great Lake boat docks. The North American Utilities Corporation of Calgary, Canada purchased the Carter Creek iron deposits from the Minerals Engineering Company. Present plans call for milling the ore in Montana, with the concentrate being shipped to Burmis, Alberta where it will be processed into iron.

The manganese industry slowed. The Emma mine was shut down during the strike and the Anaconda Company states that it will not reopen this mine, but other mines in the Butte area may become manganese producers. The other large active manganese area, Philipsburg, increased battery grade manganese pro-



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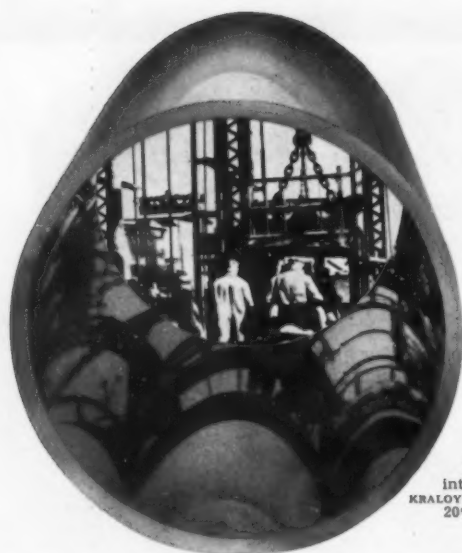
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duction but the metallurgical grade production was curtailed.

At year's end, the Minerals Engineering Company, announced that it was producing tungsten ore from some of its Montana properties.

The Atomic Energy Commission reported that uranium production rose with the mines in Carbon County, mostly in the Pryor Mountains, accounting for practically all of the production. The Sawyer Petroleum Company shipped some Thorium concentrate from its property at Lemhi Pass near the Idaho border.

Reflecting the state's decrease in metal production, non-metallic production figures in 1959 were below those of 1958. Greater production of cement, gypsum, and talc did occur in 1959 the previous year.

Nevada

► Nonmetallic Output Makes Good Gains; Gold, Uranium, Iron Also Up. Yerington Largest Copper Mine

Production of major metals and non-metallics—gold, iron, uranium, zinc, barite, fluorspar, gypsum, talc, and diatomite—were higher in Nevada during 1959 than in 1958.

The chief exception to higher output was copper because of the nearly six months long strike loss by Nevada Mines Division of Kennecott Copper Corporation, which is normally the state's largest producer of copper, molybdenum, and silver. The major addition to the Division's operations before the strike was an inclined skip haulage system at its Liberty pit at Ruth, White Pine, County.

The Yerington open pit mine of Anaconda Company at Weed Heights was the largest mine tonnage-wise in the state, and led in copper production as there was no strike by the local union. The 11,000-ton-per-day leaching plant treated newly mined open pit ore and stockpiles. The technical staff made several important improvements in mining practice with new blasting agents and stabilization of pit roads.

Round Mountain Gold Dredging Company was the leading producer of gold from its unique residual placer operation at Round Mountain, Nye County. The firm open-pitted the gravel and washed it in a nearby dredge-like mill. Reported recovery during the year was in the \$1.00-per-cubic-yard range; with many cleanups returning a much higher recovery per yard. At year's end the operation was closed and the plant and equipment offered for sale. Milling difficulty was reported as a major reason for closing. Yuba Industries, Inc. and other operators displayed keen interest in gold placers in Mineral, Pershing, and Esmeralda counties.

The Bristol mine of Bristol Silver Mines Company at Pioche was an important silver, lead, and copper producer before it lost its market for ore because of the nation-wide non-ferrous smelter workers strike.

With larger export contracts to Japanese steel mills iron ore output increased 100,000 tons during 1959. Shipments of high grade ore from the Buena Vista district south of Lovelock were also made to eastern steel mills and Kaiser Steel Corporation at Fontana, California. One

new iron ore shipper was active—Consolidated Minerals Corporation. Southern Pacific Railway Company—Mineral Materials Company's joint venture project in the Buena Vista district now has over 100,000,000 tons of proven and probable concentrating grade (29 to 32 percent) iron ore reserves. Beneficiation and economic feasibility studies were continued. Standard Slag Company deepened its Minnesota iron ore pit and operated its concentration plant one shift per day.

Cordero Mining Company continued normal operations at its Cordero mercury mine in Humboldt County. This underground mine has long been a major domestic mercury producer. At year's end one of the furnaces was being rebuilt. Seven new mercury producers shipped more than 25 flasks each during the year.

Two uranium producers—Apex Minerals Corporation and White Caps Gold Mining Company—shipped the greatest tonnage of ore in any one year. Virtually all of this ore was shipped to the Salt Lake City, Utah mill of Vitro Uranium Company. Development continued with favorable results at Apex's mine just south of Austin.

Fluorspar mining was accelerated in Beatty district with the Monolith Portland Cement Company, and J. Irving Crowell, Jr. making regular shipments.

There were only two tungsten producers, while a third, U. S. Molybdenum Company, reactivated its Alice mine in Esmeralda County and was building a mill.

Basic Inc. and Standard Slag Company operated their open pit magnesite mines near Gabbs at capacity. Despite the steel strike magnesite production rose with large export shipments. Brucite shipments were unchanged from 1958 level.

The most important discovery of the year and a discovery which might well result in a major mining operation was recognition of beryllium minerals in the tungsten-lead-zinc mine workings of Mt. Wheeler Mines south of Ely. While the tenor of the very fine grained beryllium mineralization was just under 1.0 percent. B&O indications were that a very large tonnage potential was present. A new company, Beryllium Resources Inc., was formed by Hidden Splendor Mining Company to further develop the mine for beryllium by underground drilling and drifting. Metallurgical tests were under way to develop a process to treat the ore.

Other exploration and development projects during the year were by Continental Materials Company at the Pine Tree Copper mine, by Union Carbide Nuclear Company for vanadium south of Eureka, by Claude Lovestead at the Sweetwater Silver mine, at the Aladdin Silver Lead mine by John Uhalde, and for iron ore east of Dayton by Utah Construction and Mining Company.

New Mexico

► Uranium, Perlite Set Records; Ambrosia Trend Extended Westward

New Mexico's uranium mines reached an all-time high production of ore in 1959

—3,219,000 tons, an increase of 70 percent over the 1,888,499 tons mined in 1958. All this increased tonnage came from the underground mines of Ambrosia Lake as the Jackpile open pit mine production schedule of the Anaconda Company was cut back to accommodate the company's milling contract stretch out to December 31, 1966.

Uranium was the most important metal in value as the \$54,567,000 output was more than double that of second place, copper as the long copper strike, starting in early August, reduced Kennecott's Chino Mines Division's output. Only the precipitation plant treating open pit water and pregnant solutions from waste dump leaching was operated during the strike. With the strike ended in December, normal output was resumed as was construction work on the expanded leaching and precipitation facilities.

Greatest uranium interest centered on the Western Trend of Ambrosia Lake where Phillips Petroleum Company was developing its Church Rock mine, and the Black Jack Nos. I and II mines of the Black Jack Corporation were acquired by Saber-Pinon Corporation. Homestake Mining Company, subsequently purchased substantial interest in the two mines and will mill the ore at its Homestake-Sapin Partners mill.

In the Ambrosia Lake district four uranium mills operated on underground ores from company mines and independent custom shippers. Kermac Nuclear Fuels Corporation operated its 3,630-ton-per-day mill at reduced capacity for most of the year while its mine development program was accelerated to supply ore. Kermac and associated shareholders operated the Section 10, 17, 24, 26, and 30 mines.

Phillips Petroleum Company operated its Ann Lee mine where the first sand filling in the district was carried out. First ore production was made from Phillips' new mines—the Sandstone and Cliffside southeast of the mill.

Homestake-New Mexico Partners operated its carbonate leach plant at capacity treating ore from Partner's mines and purchased ores.

Rio de Oro Uranium Mines, Inc. continued large scale production and brought its Dysart mine up to a district record output of 2,000 tons per day. This ore was treated at the Partners' mill as well as at Phillips.

Rare Metals Corporation of America made first production at its San Mateo mine, the southeastern most in the district. Four Corners Exploration Company developed its high grade Hogan mine and made first shipments. Haystack Mountain Development Company (Santa Fe) increased underground mining rate as its Poison Canyon and other open pit mines were worked out.

Homestake-Sapin Partners finished initial development and advanced the mining rate at its Section 15, 23, and 25 mines in the heart of Ambrosia Lake.

The six producing potash companies in the Carlsbad Basin set a new record by producing 2,200,000 tons of potash salts (K₂O equivalent) during 1959. All companies modernized mills, installed new mining equipment, and concentrated on increasing efficiency and reducing costs. International Minerals & Chemical Corporation made plans to mine thin ore, 4 to 5 feet thick, at its mine. Duval Sulphur and Potash Company made plans to develop a new underground potash mine about 14 miles north of its existing mine.

Perlite production rose to 216,000 tons for a new record as United Perlite Corpo-



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ration, subsidiary of United Western Minerals Company, started its new 200-ton-per-day mill in the Seven Hills near Taos in January. Great Lakes Carbon Corporation operated mills at Socorro and No Agua. A new corporation, Johns-Manville Perlite Corporation, was formed in September by John-Manville Corporation to operate the purchased mine and mill of the F. E. Schundler & Company near No Agua.

New Jersey Zinc Company's Empire Zinc Division reopened its Hanover open pit and underground zinc mines and flotation mill in August. The company also milled lessee's ore from the Lynchburg mine at Magdalena.

American Zinc Lead, and Smelting Company joined Peru Mining Company in a joint venture project at the latter's Pewabic and Kearney mines in Grant County. Geological studies and diamond drilling were started.

Oregon

► Nickel and Uranium Mining Active; Gold Output Reaches All-Time Low

Nickel and uranium accounted for most of the value of Oregon's 1960 metal mining production. Output of gold was at an all-time low and mercury production declined 42 percent from 1958. Chromite mines and mills remained closed because of completion of the federal stockpiling program in mid-1958. The state's refractory metals processing industry continued to grow.

NICKEL: About 800,000 tons of ore averaging 1.5 percent nickel was mined by open-pit methods near Riddle by Hanna Mining Company. The nearby Hanna Nickel Smelting Company plant produced approximately 21,000,000 pounds of nickel contained in ferro-nickel (40 to 45 percent nickel).

URANIUM: Lakeview Mining Company's new uranium processing plant was operated an average of 22 days monthly on a three-shift basis and processed 6,000 tons of ore monthly. Company underground mining operations were discontinued in April in favor of open-pit mining, with Isbell Construction Company contracting to remove more than 6,000,000 cubic yards of overburden and ore.

GOLD: Only 420 ounces of gold were recovered, compared with 1,650 ounces in 1958, 18,979 in the best post-war year of 1947, and 96,525 ounces in 1941.

MERCURY: Output totaled 1,300 flasks, of which 60 percent was from the Bonanza mine in Douglas County and most of the remainder from the Bretz open pit in Malheur County. Mercury exploration was at low ebb.

NONMETALLICS: Output of pumice and volcanic cinder for lightweight concrete aggregate increased 8 percent over 1958. Diatomite production was up 7 percent. Limestone production increased. High-grade metallurgical silica was produced on the Rogue River, Jackson County. Production of soda from Alkali Lake was resumed after a lapse of many years. Some bentonite was mined near Prineville.

ELECTRO-PROCESS PRODUCTS: Expanding metallurgical plants at Albany, using imported raw materials, produced ingots and castings of columbium, tantalum, molybdenum, tungsten, titan-

ium, vanadium, zirconium, and hafnium, zirconium and titanium sponge, and high-purity vanadium.

South Dakota

▲ Homestake Mine Sinks To 6,256 Foot Depth. Pilot Scale Mill For Chamberlain Manganese Deposits

Mining activity in South Dakota continued during 1959 at about the same level of activity as in 1958. Gold and silver accounted for approximately 50 percent of the value of mineral products, sand and gravel for another 25 percent, and stone, 10 percent. The rest of the income was contributed by beryl, cement, clays and bentonite, feldspar, lime, mica, and uranium.

Two major developments occurred in gold mining. Homestake Mining Company finished a new ventilation shaft from the surface to the 5000-foot level, and completed a winze below this level to 6,256 feet. In addition to the greater cost of mining from this depth, it was reported that the ore below the 5,000-foot level was disappointing in its lack of continuity from higher levels.

The other major news in gold was the closing of the Bald Mountain Mining Company's mine at Trojan. This gold-silver mine had been in operation at least since 1901, following its discovery in 1877. The low grade of the ore coupled with rising costs and a frozen gold price were contributing causes.

A dramatic use of a South Dakota mineral commodity, bentonite, received widespread publicity at the time of the Deadwood fire in September. The bentonite slurry was dumped from planes, effectively smothering the flames and protecting combustible vegetation nearby.

A new industry in South Dakota is taking shape 20 miles northwest of Custer, where the Black Hills Silica Sand Corporation is developing facilities to produce uniform sand for hydraulic fracturing uses in oil fields, and for foundry purposes.

A potential new mineral product is manganese in the Chamberlain area, where the Pittsburgh-Pacific Company has a pilot plant operation set up.

Uranium mining continued as in 1958, with a small flurry of operators trying to get ore to the Mines Development Inc.'s mill before March, 1961 when the initial production bonus expires.

MINE AND METAL PRODUCTION

Please turn to the following pages for details on:

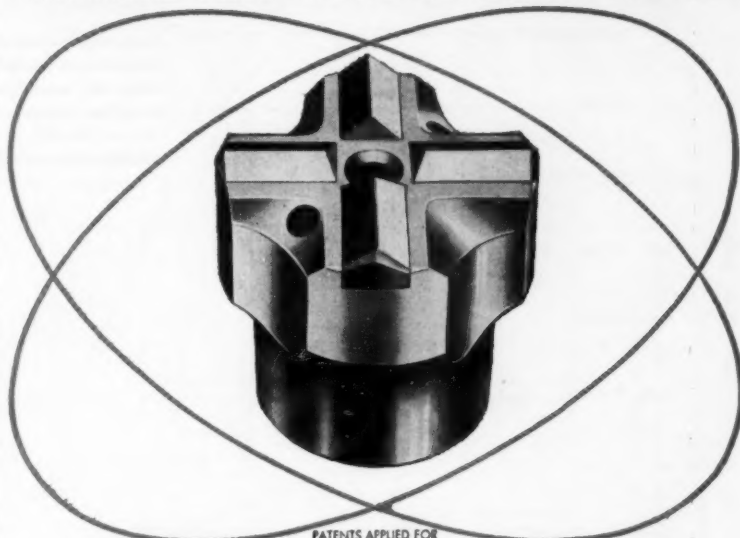
Metal and Mineral Production by States, pages 95 to 99.

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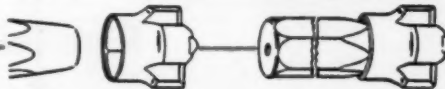
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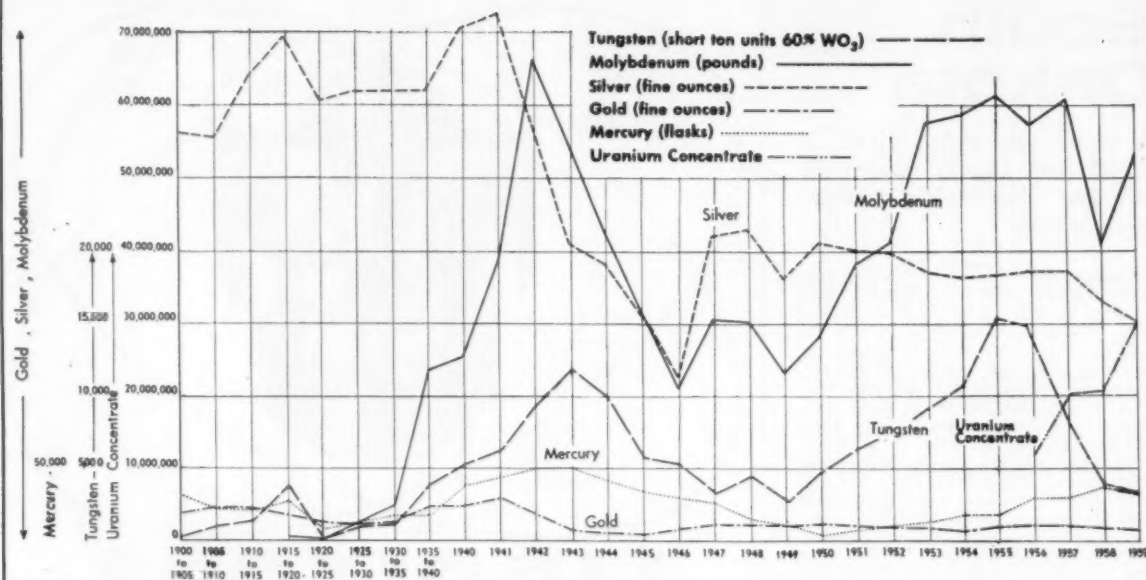
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U. S. MINE PRODUCTION OF KEY METALS FROM 1900 TO 1960



Southeast

► Exploration at High Level; Tennessee Copper Develops Silver Hill Mine

Tennessee Copper Company's new mine at Silver Hill, Davidson County, North Carolina, should be considered the mining highlight in the southeast for 1959. The mine appears to be an extension of shallow silver bearing veins that were mined before the Civil War. Exploration was by geophysical methods, then surface diamond drilling, and finally, deepening and enlarging an existing

shaft. Potential of the mine is thought to be large in silver, zinc, copper, and gold.

Tungsten Mining Corporation's Hamme mine in North Carolina was inactive, but a small amount of concentrate was shipped from stock. Spodumene was mined from pegmatites and milled by Foote Mineral Company in the southern part of the state to produce lithium concentrates.

In Virginia, 20,000 tons of zinc was produced by New Jersey Zinc Company's Austinville and Ivanhoe mines, and by Tri-State Zinc Company's new mine at Timberville. Allied Chemical Corporation mined pyrrhotite near Cliftview for its sulphur content. Metal and Thermit Corporation continued mining illmenite and rutile near Montpelier,

Virginia.

Alabama, the largest iron ore producer in the southeast, recorded a five percent increase in output to almost 4,000,000 tons. Bauxite production was twenty-six percent higher than in 1958.

As in previous years, Florida led the entire United States in the amount of phosphate rock mined. In 1959, it was 11,000,000 long tons. Florida's production of phosphate and heavy minerals was great enough to place it fourth in southeast mineral production—an unusually high position for a coastal plain state.

Since almost all manganese mined in the southeast went into the government stockpile, the mines shut down in August when the stockpile quota was reached. By the end of the year, the underground



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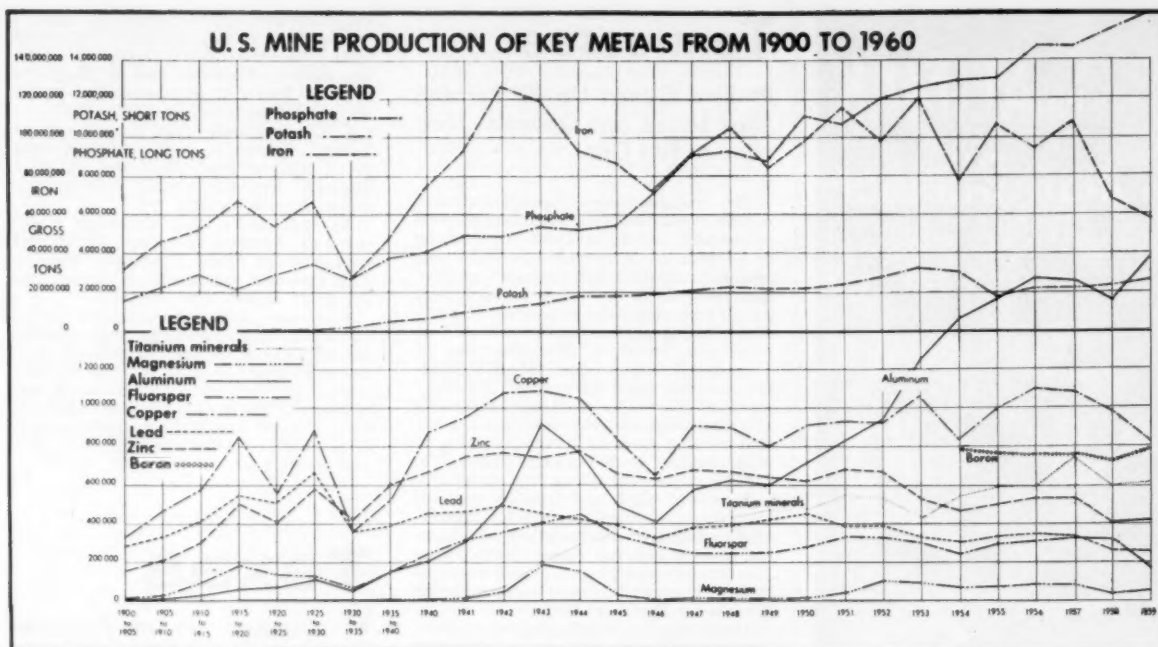
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mines had flooded.

Exploration in the southeast was at a slightly stronger pace than in 1958. Tennessee Copper Company was reported to be actively diamond drilling prospects in North Carolina and Georgia. American Cyanamid Company conducted mag-

netometer surveys in Virginia in search of additional nelsonite bodies. Nelsonite is a lens shaped body of rock containing abundant ilmenite, rutile, and apatite.

Exploration for copper in North Carolina continued throughout the year, most of the work being concentrated in and

near old mines and prospects in the mountain and Central Piedmont areas. Geochemical methods were widely used. The deepest exploratory hole reported was about 1,400 feet and was located near the old Phoenix mine in Cabarrus County.



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20	1.14	27	41	55	68	82
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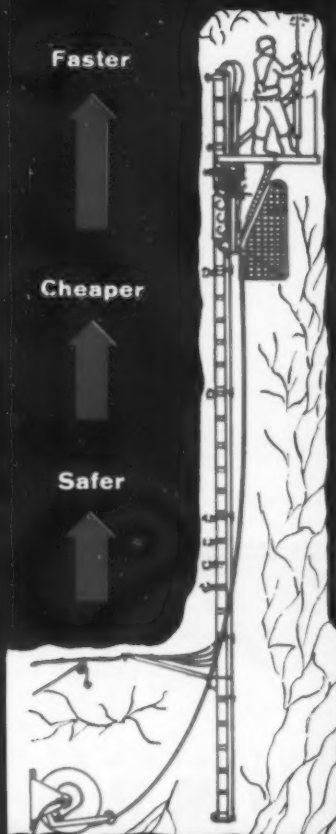
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Tennessee

► Zinc Output Up 47 Percent; New Jersey Zinc Operates New Mine at Flat Gap

The continued rapid expansion of zinc mining dominated the Tennessee mineral production picture in 1959. An increase of 47 percent in output over 1958 was achieved. Most of the increased production came from New Jersey Zinc Company's Flat Gap mine (Treadway Trend), which began production the first of January, and American Zinc Company of Tennessee's Young mine, where production was increased 25 percent. Development at New Jersey Zinc Company's Flat Gap mine was almost completed before mining began. In this manner, it was possible to get production up to 2,000 tons per day within 12 months.

Tennessee Coal and Iron Division of United States Steel Corporation discovered a deep zinc ore body between Mascot and Strawberry Plains. New Jersey Zinc continued exploration with reported high success in the new Copper Ridge (Treadway Trend) district.

Many zinc companies continued drilling leased land in the Mascot-Jefferson City district with extended DMEA loans. Some holes were in ore at depths of 2,500 feet.

Mines in the Mascot-Jefferson City district produced a total daily output of 10,500 tons of ore. Combined with additional byproduct zinc, produced at Tennessee Copper Company's Ducktown property, the value of zinc mined in Tennessee amounted to almost \$20,000,000 dollars, which was approximately 15 percent of Tennessee's \$135,000,000 mineral output for 1959.

Manganese mining in northeast Tennessee came to a standstill in August when government stockpile quotas were reached. Total production for the year amounted to 6,000 tons, which was about the same as produced during 1958.

A high rate of copper mining continued in the Ducktown-Copperhill district where output was increased 24 percent over last year. Most of this copper reaches the market in the form of copper chemicals rather than in the form of metal. Tennessee Copper Company is developing its School House ore body which may step up activity in the copper district to an even higher rate. A drift, 6,000 feet long, is being driven from the Central hoisting shaft to the ore shoot. The Cherokee shaft will be used to take men and supplies into the ore body.

Tennessee Products Corporation at Rockwood, Tennessee, kept its blast furnace operating, but almost all iron ore was imported from out of the state. Toward the end of the year, the firm was preparing to start the No. 2 furnace with hematite ore from Union County, Tennessee. Tennessee Products Corporation manufactures pig iron and ferrosilicon.

Footo Mineral Company produced high purity manganese in its electro-smelting plant at Knoxville. High grade ore is imported from Africa for use in this process. During the year, the plant underwent a \$200,000 expansion that was designed to increase output.

DuPont's titanium dioxide plant at New Johnsonville went on stream in September of 1959, with a daily output of 125 tons. Since the plant was still having trouble with the small grain size of the ore discovered near the plant, all con-

centrates were shipped into the state.

Phosphate mining in central Tennessee held at the same rate as last year, which was close to 2,000,000 tons of phosphate rock. A \$500,000 expansion now under way at International Mineral and Chemical Corporation's phosphate plant at Wales, Tennessee, will help increase production in 1960. Recovery of some products formerly wasted will be attempted at this plant.

In June 1959, the Aluminum Company of America reopened the second potline at its Alcoa, Tennessee, smelter. This increased production at the smelter by about 12,000 tons annually.

Only one barite mine operated in the Sweetwater district in southeast Tennessee in 1959. This mine produced only chemical grade rock. In the Del Rio district, a five-foot wide vein of barite was prospected by surface diamond drilling. Over 100,000 tons of glass grade ore was found, but no market was available at the end of the year.

Texas

► American Lithium Produces Cesium and Rubidium; Activity in Talc Mining

Texas continued to be a very important metallurgical center during 1959 as a wide variety of metals were recovered from domestic and foreign ores. The nation's only tin smelter, treating imported concentrates, was operated at Texas City by the Wah Chang Corporation. National Lead Company recovered antimony metal from Mexican ores at its Laredo smelter. Lithium ores from Bikita, Southern Rhodesia, yielded lithium hydroxide, and cesium and rubidium metal at the San Antonio plant of American Lithium Chemical, Inc.

The state's two zinc smelters and one electrolytic refinery were not affected by the general non-ferrous smelter strike. American Smelting and Refining Company operated at Amarillo and Corpus Christi; American Zinc Lead, and Smelting Company at Dumas.

American Smelting and Refining Company's El Paso copper and lead smelter and Phelps Dodge Corporation's electrolytic copper refinery, also at El Paso, were both closed by strike on August 20th. Only ASARCO's smelter resumed operation in mid-December.

Texas grew as an important alumina and aluminum producing state as Aluminum Company of America started its new Point Comfort plant in February. Two units each will treat imported bauxite from the Dominican Republic and Surinam. Reynolds Metals Company enlarged auxiliary facilities at its Sherwin alumina plant.

Lone Star Steel Company was unaffected by the nationwide steel strike and operated its east Texas open-pit iron mines and beneficiation plant at capacity. Dow Chemical Company expanded magnesium metal recovery at its Velasco sea water plant.

The most important non-metallic development was expanded mining and mill building in the growing Hudspeth County talc district. Output was up to 68,000 tons compared to 60,827 in 1958. Southwestern Talc Company was the largest producer. Pioneer Talc Company

was completing a new 120-ton-per-day mill at Allamoore at year's end. Five companies marketed tale and four additional firms continued exploration and development.

Frash process sulphur output from Gulf Coast domes rose from 2,616,000 tons in 1958 to 2,800,000 tons in 1959. Producing companies were: Duval Sulphur and Potash Company, Texas Gulf Sulphur Company, Jefferson Lake Sulphur Company, and Freeport Sulphur Company.

Tri-State

► All Lead-Zinc Output Came From Treating Slime Tailings at Central Mill

The Eagle-Picher Company became the only major company with extensive mining and milling facilities in the Tri-State district as it purchased all mining equipment, and most of the mine leases of the National Lead Company during the year. National Lead for many years had been a major producer of zinc and lead from its mines and mill south of Baxter Springs, Kansas. National Lead plans to move the mill to its southeast Missouri operations.

Eagle-Picher only operated its Central Mill at Cardin, Oklahoma on a much reduced scale during the last five months of the year to treat accumulated slime tailings. With no mines producing, all zinc output, 494 tons from Oklahoma and 306 from Kansas, as well as all lead output, 275 tons from Oklahoma and 160 from Kansas, came from the Central Mill. At year's end there were reports of preliminary plans to increase milling rate.

Three retort zinc smelters operated at reduced rates in Oklahoma treating large tonnages of foreign concentrates and out-of-state concentrates in contrast to small tonnage of locally produced concentrate. National Zinc Company operated its Bartlesville smelter, American Metal Climax, Inc. its Blackwell smelter, and Eagle Picher Company its Henryetta smelter.

Two Kansas smelters produced pigments during the year. Sherwin-Williams Company made lead pigments and barium chemicals at Coffeyville, and Eagle-Picher Company's Galena smelter made lead pigments.

Utah

► Bear Creek Makes Discoveries at Tintic; Potash and Phosphate Interest at High Level.

Bear Creek Mining Company's important lead-silver-zinc discoveries in the Tintic area were the most important developments of 1959 in Utah's mining scene. This Kennecott Copper Corporation subsidiary made the discoveries through its Burgin shaft on a unitized group of claims owned by Chief Consolidated Mining Company, Tintic Standard Mining Company, and other companies. Underground drifting, cross cutting, and diamond drilling indicated at least

two ore bodies. A second deeper shaft, in all probability, will have to be sunk before important production can be made.

The world's largest mine, Utah Division of Kennecott Copper Corporation, was closed from mid-August to year's end by a labor strike. This dropped copper output from 189,184 to 151,300 tons in the state. Gold, silver, and molybdenum output fell for the same reason. The Utah Division continued work on a new steam-electric power plant, and operated the Garfield copper smelter for its own account during the year after its purchase in late 1958 from the American Smelting and Refining Company. At the Bingham Canyon mine contractors finished the new low level haulage tunnel ahead of schedule and stripped overburden under an 8,000,000 cubic yard contract.

United States Smelting, Refining and Mining Company operated its Lark and U. S. lead-silver-zinc mines during the year and milled this ore at its Midvale differential flotation mill. The company sold its Midvale lead smelter in June.

In the Park City district New Park Mining Company continued its long range deep exploration program into favorable limestone horizons west of its mine workings. Regular production continued under a split check arrangement with mine contractors. United Park City Mines Company continued its major exploration and development program during the year while maintaining lead-silver-zinc production. A deeper exploration program was started at year's end. Armet Company, Chief Consolidated Mining Company, and Cerro de Pasco Corporation continued exploration at the Holt silver mine in Iron County under a joint venture.

San Francisco Chemical Company added to its phosphate reserves by purchasing 15 claims in Rich County from the United States Phosphate Company. San Francisco Mining Company, jointly owned by San Francisco Chemical and Mountain Copper Company Ltd. optioned the Humphreys phosphate deposits in Uintah County. Plans for 35,000-kilowatt electric furnaces to produce elemental phosphorus were made by San Francisco Chemical. This project awaits hydroelectric power from the Flaming Gorge dam.

Interest in potash continued high as the Delhi-Taylor Oil Company negotiated with Armour & Company, Chicago meat packer, for development of its deep potash reserves near Dead Horse Point in Grand County west of Moab. To the southeast in San Juan County the Superior Oil Company of California is reported to have discovered potash while drilling for oil in Lisbon Valley.

Uranium ore production dropped 5 percent from 1958 to 1,183,000 tons. The government-owned Monticello mill was

MINE AND METAL PRODUCTION

Please turn to the following pages for details on:

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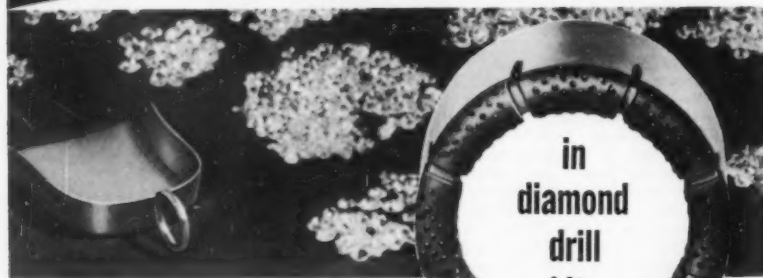
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closed at year's end. Uranium Reduction Company placed its new alkaline leach circuit in operation late in the year to treat Big Indian District high lime ores. Extended uranium milling contracts through 1966 were made with the Atomic Energy Commission by Uranium Reduction and Texas-Zinc Minerals Corporation. Standard Uranium Corporation, Hidden Splendor Mining Company, Utex Exploration Company, Homestake Mining Company, and Hecla Mining Company were forced to curtail uranium production at their mines in the Big Indian district to fit the ore buying schedules at several mills under the extended concentrate purchasing contracts of the Atomic Energy Commission.

The July to November steel strike closed the iron mines of Columbia Iron Mining Company, Colorado Fuel and Iron Corporation, and the Utah Construction and Mining Company so that iron ore output fell from 3,514,000 tons in 1958 to 2,785,000 in 1959.

American Gilsonite Company increased gilsonite output from 700 to 1,000 daily tons by underground hydraulic mining at its mines at Bonanza. A surface controlled vertical jet mining system was under study.

Great Salt Lake continued to yield potash and sodium chloride by evaporation. Utah Salt Company harvested and processed salt from Bonneville Ltd's. potash tailing at Wendover. Leslie Salt Company purchased the Deseret Salt Company and made plans for production. A new firm—Solar Salt Company—made first shipments from its evaporation ponds in Tooele County to chemical plants of the Pacific Northwest.

Washington

► Knob Hill Ranks Fourth in U.S. Gold Output; Metaline Falls Lead-Zinc Mines Busy

Although mining exploration and development work was at a low rate because of poor marketing conditions for a number of metals, operating mines increased production of uranium, lead, gold, and silver. This offset lower output of zinc, magnesite, copper, and barite.

URANIUM: Dawn Mining Company, controlled by Newmont Mining Corporation, mined 130,000 tons of uranium ore from the Midnite mine in the Spokane Indian Reservation, Stevens County, and milled 160,000 tons of ore in its uranium reduction plant at the east entrance to the reservation. Silver Buckle Mining Company, Wallace, Idaho, made substantial custom shipments to the Dawn mill from an open-pit mine in the reservation. A few small ore shipments were made from the Mount Spokane district in northern Spokane County. Exploration work by small mining firms came virtually to an end.

LEAD: Washington's only substantial lead producers, Pend Oreille Mines & Metals Company and American Zinc, Lead & Smelting Company (Grandview mine) Pend Oreille County, upped production about 14 percent over 1958. A few truckloads of high-grade ore were mined at the Gladstone lease in Stevens County. Utahcan Mines, Inc., completed a 150-ton lead-zinc-silver concentrator

near Ione, Pend Oreille County, and shipped a little concentrate.

GOLD-SILVER: The Knob Hill Mines, Inc., Republic district, Ferry County, mined excellent ore from its own property and the adjoining Gold Dollar mine of Day Mines, Inc., Wallace, Idaho. Values have been improving with depth and Knob Hill now ranks as the fourth largest gold producer in the United States. Lovitt Mining Company's Gold King mine at Wenatchee, Chelan County, again was a substantial producer of gold-silver ore with a high silica content.

ZINC: Zinc output was 10 percent below 1958 but production of nearly 17,000 tons was well ahead of lead recovery, which was slightly more than 10,000 tons. The Pend Oreille and Grandview mines accounted for virtually all the state's production. Goldfield Consolidated Mines Company did diamond drilling exploration at its Anderson open-pit mine in northern Stevens County with reported good results.

MAGNESITE: Northwest Magnesite Company curtailed production of magnesite 10 percent because of the steel strike but continued to rank as the No. 1 producer in the United States. Plant and quarries are at Chewelah, Stevens County.

MANGANESE: An 82-ton shipment of 42-percent manganese was made by Inland Empire Mining Company from southwest of Port Angeles, Clallam County.

MERCURY: There was no production but development work was carried on at two King County mines, the Royal Reward and Cardinal Reward.

IRON: Production was limited to about 4,000 long tons from the Kulzer mine, Stevens County, for consumption at a local cement plant. Japanese interests showed interest in the Buckhorn mine, Okanogan County, and a ton of ore was shipped for metallurgical testing. The Washington State Department of Conservation and Development made a \$40,000 aerial magnetometer survey of the Republic-Danville area as part of an investigative program aimed at determining if an iron smelting industry can be established in the state.

DIATOMITE-GYPSUM—Kenite Corporation increased its output of diatomite at Quincy, Grant County. Agro Minerals, Inc., produced all of the state's gypsum from Poison Lake near Tonasket, Okanogan County.

MISCELLANEOUS: A small amount of barite was mined by two producers in Stevens County. Output of pumice and pumicite declined about 33 percent. Clay production increased slightly. Mineral Products Corporation processed a small amount of strontium minerals.

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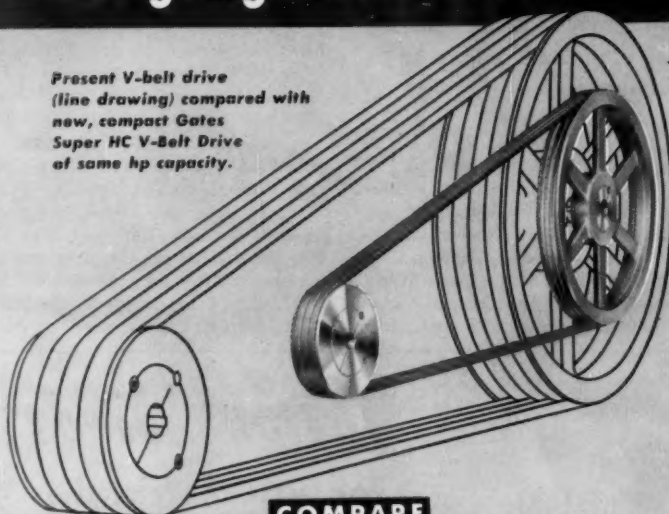
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Wyoming

► Underground Uranium Mining Grows; Utah Gets Shirley Basin Ore Contract

Four uranium mills were operating at year's end. In order of their first production and renegotiated capacity from the AEC they were: Western Nuclear Corporation, 845 tons; Lucky Mc Uranium Corporation, 980 tons; Susquehanna Western, Inc., 850 tons; ANP Federal-Radorock-Gas-Hills Partners, 522 tons. The

Globe Mining Company's (Union Carbide Nuclear Company)—492 ton East Gas Hills mill was virtually completed at year's end.

While most of the uranium ore production came from open pits, underground mining will grow in importance as Continental Materials Corporation and Green Mountain Uranium Company Corporation (Phelps Dodge Corporation) operated underground mines in the Crooks Gap district; Hidden Splendor Mining Company developed a new 500-foot-deep mine in the Gas Hills; and Utah Construction and Mining Company was sinking the 400-foot-deep Christensen shaft to develop a new mine in the Shirley Basin district. Utah secured an Atomic

Energy Commission allotment for milling its Shirley Basin ore through 1966 which will permit extensive underground operations. Ore will be trucked to Gas Hills and milled at what was the Lucky Mc Uranium Corporation's mill there until that corporation was absorbed by Utah at year's end.

Gas Hills and West Gas Hills open pits continued to grow in size and depth during the year. Stripping ratios were reaching the point that systems other than Diesel shovel loading of rubber tired haulage units were under consideration at year's end for waste removal.

Largest stripping job was undertaken by Western Nuclear, Inc. at its Frazier-Lamac mine where 6,000,000 of an estimated 18,000,000 cubic yards of overburden had been stripped at year's end. Ore production started late in the year. Federal-Radorock-Gas Hills Partners stripped 1,600,000 cubic yards from its Buss pit in the East Gas Hills. Globe Mining Company (Union Carbide Nuclear Company) stripped two pits—one near its new mill and the other 12 miles away. Lucky Mc stripped its project No. 6 pit to a depth of 140 feet and continued mining at its other pits. Vitro Minerals Corporation continued deep stripping in the central Gas Hills with its walking dragline.

So spectacular have been the Gas Hills developments that uranium in the northeastern part of the state has almost been overlooked. However, the Black Hills have proved to be an important source of uranium with the Hauber underground mine of Homestake Mining Company at Hulett actually being the largest underground uranium mine in the state. This ore is trucked to South Dakota for milling.

Exploration for trona in the Green River district reached a new peak during the year with four companies known to be drilling and reports of a fifth company holding leases. The most active companies were J. R. Simplot Company (Ruby Mining Company), Kern County Land Company, Stauffer Chemical Company, Diamond Alkali Chemical Company, and reportedly the Potash Company of America. Many holes hit ore and millions of tons of reserves have been blocked out. The present producer, Intermountain Chemical Company, installed a new roasting step in its refining to remove vegetal organic remnants in the ore.

Interest in iron ore continued at a record high during the year with the Columbia Geneva Division of United States Steel Corporation virtually completing plans for a major open pit taconite mine and magnetic concentrating mill at Atlantic City. The Bechtel Corporation of San Francisco, California completed specifications and detailed drawings. Construction bid proposals were received from several major contractors in October, but by year's end no contract had been awarded. This new mill necessitates building of a 75 mile long standard gauge railroad to the Union Pacific Railroad. That firm's engineers have already surveyed the right of way and have done all preliminary work required for actual railroad building.

Colorado Fuel and Iron Corporation's Sunrise underground mine was closed by the steel strike with a consequent cut in iron ore production.



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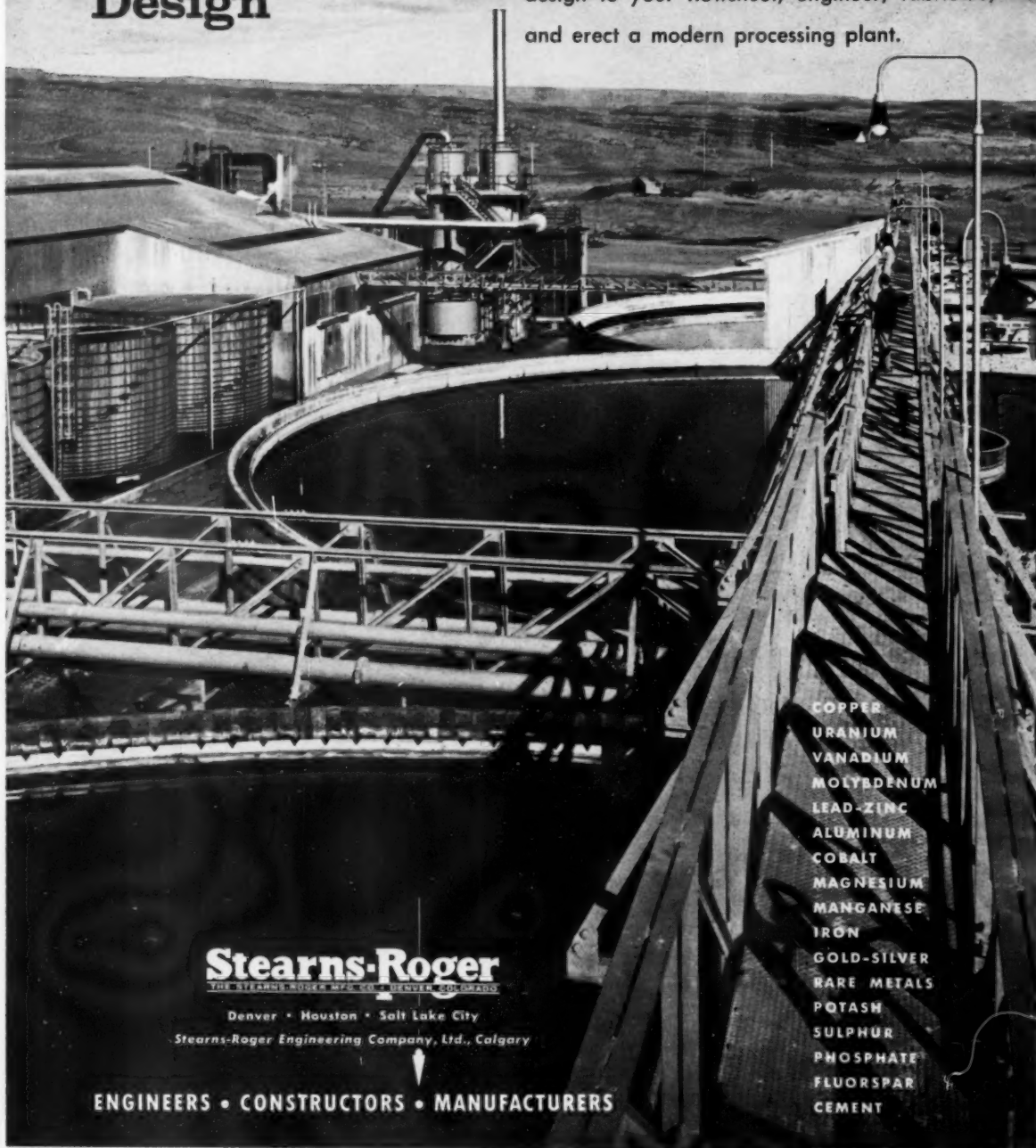
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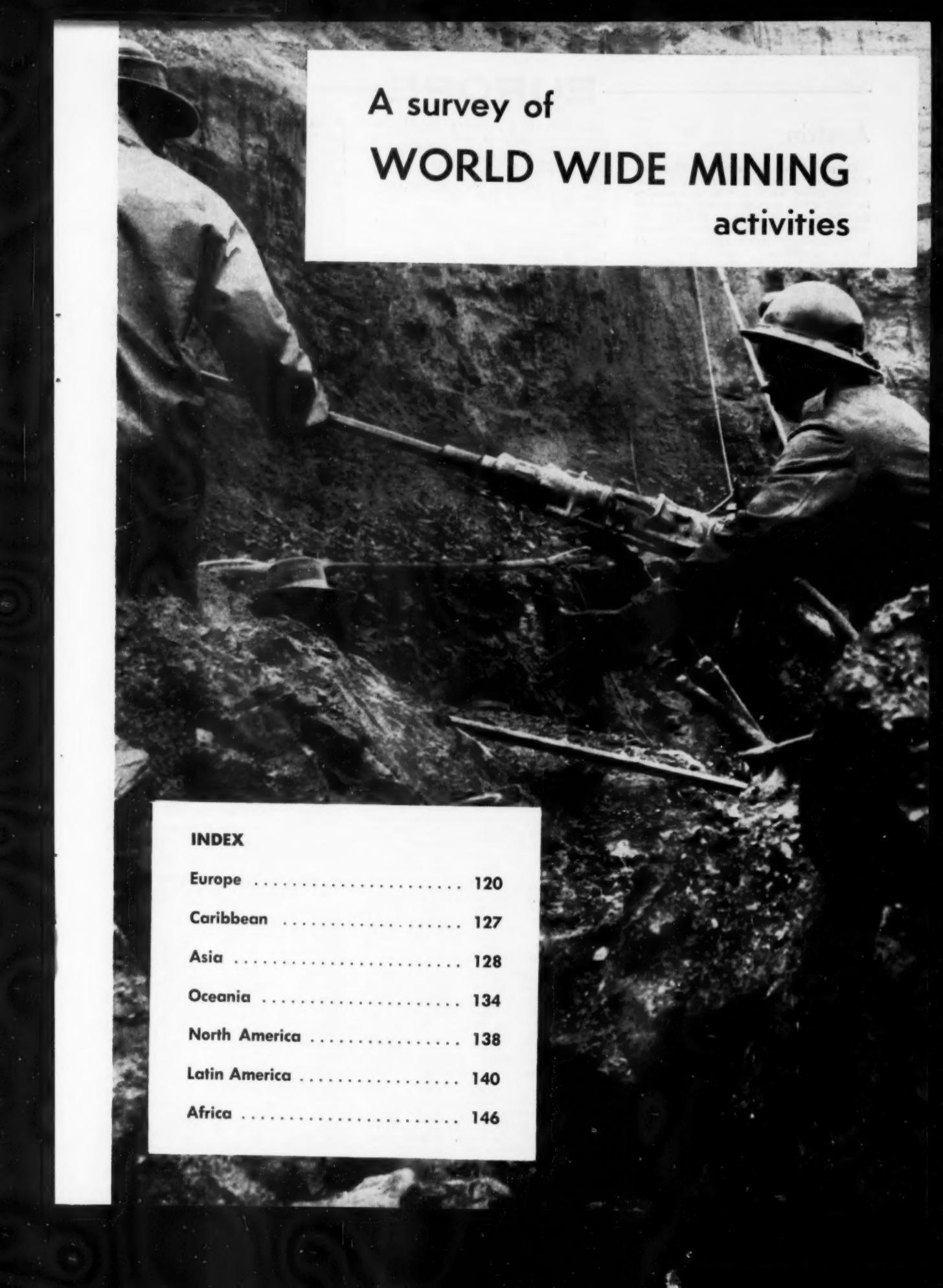
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A survey of
WORLD WIDE MINING
activities

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Austria

Output of iron ore and magnesite, Austria's chief mining products, remained slightly below 1958, due to the recession in the steel market which prevailed throughout the first months of 1959. The second half of the year, however, showed a definite improvement of the output of both commodities.

Gypsum and anhydrite production increased to meet the steadily growing demands of the chemical industry. Mines producing talcum and kaolin were forced to reduce output and in some instances stockpiled ore as eastern European countries limited imports of these minerals from Austria.

Tungsten mining which was started in 1957 in Tux, province of Tyrol, by Osterr.-Amerikan. Magnesite A. G. continued to expand. The scheelite ore averages 2.0 percent WO₃. Production in 1959 was slightly higher than the 5,820 tons mined in 1958 which yielded 112 tons of concentrate assaying 70.7 percent WO₃.

An unknown barium oxide ore body was discovered near a closed mine at Oberzeiring, province of Styria. At year's end reserves were estimated at 100,000 tons. Mining at a monthly rate of 6,000 tons is scheduled for 1960.

The most exciting and also surprising fact in Austria's mining industry, however, was the almost 200 percent increase of graphite production in 1959 as compared with the previous year. At the beginning of 1959 a new mining operation was established near Zettlitz, province of Lower Austria, which in early spring commenced open-pit mining of a crystalline graphite mineral averaging about 50 percent C. According to an Austrian patent this graphite ore is used successfully as a valuable additive in the blast furnaces of Donawitz, Alpine Montangesellschaft. The 1959 graphite output places Austria as second largest graphite producer in the world after Korea. Outlook for 1960: Mining of iron, magnesite, gypsum, anhydrite, and graphite very likely will surpass 1959.

Austrian Production of Ores, Minerals and Metals in Metric Tons for 1957, 1958, and 1959

Commodity	1957	1958	1959
Iron ore, total	3,495,721	3,410,381	3,382,348
Lead-Zinc ore	182,845	187,912	193,957
Copper ore	165,177	164,489	162,600
Antimony ore	11,023	11,198	12,978
Bauxite	22,325	23,570	23,981
Gypsum & anhydrite	525,636	541,988	563,556
Graphite	18,921	21,154	62,091
Magnesite	1,172,598	1,221,193	1,201,210
Talcum	73,405	70,828	50,777
Kaolin	292,248	300,265	297,583
Lead concentrate	7,467	7,486	7,426
Copper concentrate	8,461	9,392	9,713
Aluminum	72,800	74,266	75,348

Eire

Copper continued its comeback as the leading mineral, with further aid by the government to St. Patrick Copper Mines Ltd. for developing additional deposits at its mine at Avoca, County Wicklow, the country's largest. Capacity of its flotation mill is being increased to 7,500 tons of ore daily.

At the Mountain mine of Can-Erin Mines Limited in County Cork the ore

structure has been proved to extend below previous workings, so similar conditions are expected in the four immediately adjacent mines where development work is planned. Exploration indicates reserves in the Allibies area that will permit an overall mining rate of up to 4,000 tons daily during the next few years. Reserves have been estimated at about 6,000,000 tons of two percent copper ore.

Silver Mines Lead and Zinc Company Ltd. of Shallee, County Tipperary, has undertaken a limited diamond drilling program and gravimetric survey that resulted in discovery of some 500,000 tons of barite ore averaging 88.4 percent barium sulphate being proved. A further 1,000,000 tons of ore have been indicated.

Explorations for lead and zinc continued in 1959 in County Kilkenny and at Glendalough, in County Wicklow, as well as some survey work for lead, zinc, and copper in County Wexford and County Donegal.

Finland

In the Finnish mining industry the year 1959 was characterized by active new developments throughout the country.

Late in 1959 the Outokumpu Company started a new copper-nickel mine at Kotolahti after two years' development work. Full production will be reached in 1960. Annual rate of mining is planned at 300,000 tons. Copper concentrate will be smelted in the company's smelter at Harjavalta. For the treatment of nickel concentrate, a separate new nickel plant was built.

At Korsnäs, development of a small lead mine by the Outokumpu Company continued. Operation will start in 1960.

At Pyhäsalmi in central Finland, Outokumpu Company is opening a new mine which is expected to play an important role in several fields of Finnish industry. The ore body was discovered in August, 1958. In less than a year 15,000,000 tons of heavy sulphide ore had been verified. The ore consists of almost compact sul-

Mine Production in Terms of Ores Milled, Minerals and Metals Recovered by Finnish Mining Companies in Metric Tons for 1957, 1958, and 1959

Commodity	1957	1958	1959
OUTOKUMPU COMPANY			
Ore milled, tons	1,387,668	1,431,555	1,455,899
Copper conc. ^{1,2}	122,239	138,725	144,645
Pyrite conc.	292,340	250,072	258,011
Zinc conc.	80,859	85,630	98,383
Lead conc.	4,489	3,970	3,363
Tungsten conc.	—	318	67

OTANMÄKI COMPANY			
At Otanmäki			
Ore mined, tons ³	802,244	830,042	739,305
Ore milled, tons ³	628,702	639,379	573,535
Magnetite conc.	209,783	214,970	171,969
Ilmenite conc.	105,749	106,489	86,152
Pyrite conc.	4,814	4,473	4,769
VO ₂ (100%)	469.1	696.7	903
At Kärvasvaara			
Ore mined, tons	—	—	56,000
Magnetite conc.	—	—	34,054

VUOKSENNISKA COMPANY			
Ore milled, tons	108,225	107,000	118,000
Gold ⁴	197	202	230
Copper conc.	1,913	1,440	3,080

1. Average Cu content for 1958 was 20.5 percent.
2. Average Cu content for 1959 was 20.9 percent.
3. Difference between ore mined and ore milled is the lump waste separated in magnetic cobbling plant.
4. Kilograms.

phides, where pyrite grains are cemented together by chalcopryrite and sphalerite. Future operations are planned for 600,000 tons of ore per year. Copper concentrate, and pyrite concentrate will be produced. The large tonnage of pyrite concentrate will be roasted in a separate plant to produce SO₂, or elementary sulphur, and iron sinter. From the heat developed, electric power will be generated. At Pyhäsalmi large scale development and building was in full progress. A headframe, the second highest in the world, was built. Operations may start in 1961 or 1962.

During summer 1959, Otanmäki Company started a small new iron mine at Kärvasvaara in northern Finland, above the Arctic Circle. The ore itself is rich in magnetite. Production is planned at 10,000 tons of high grade magnetite concentrate per month.

Development work at Jussarö is being continued by the Vuoksenniska Company. The main shaft, 240 meters deep, was completed. Production is expected to begin in 1961.

Federal Republic of Germany

Mine production of lead and zinc decreased in 1959 due to the depressed state of the lead and zinc industry in the world. Also, the output of pyrite was lower due to increased competition from native and byproduct sulfur.

Production of iron ore, potash salts, and rock salt was higher in 1959, compared to the previous year. Smelter production of all the metals covered by the accompanying table was higher in 1959.

Smelter Production in Western Germany in Metric Tons in 1957, 1958, and 1959

Metal	1957	1958	1959 ¹
Aluminum	153,838	136,766	151,165
Lead ²	177,341	173,404	192,419
Copper, refined	253,389	268,249	281,889
Zinc, excluding dust	185,407	179,253	187,943
Tin, unalloyed	2,081	1,827	2,108
Tin alloys	3,100	2,770	3,105
Solder	10,279	11,794	12,959
Pig iron	18,358,000	16,659,000	18,392,000
Steel ingots and castings	24,507,000	22,785,000	25,800,000

1. Preliminary figures, excluding Saar. 2. Includes lead produced by battery manufacturers.

Mine Production of Metals and Minerals in Metric Tons in 1957, 1958, and 1959

Commodity	1957	1958	1959 ¹
Lead ore ²	72,000	61,900	53,000
Zinc ore ^{2,3}	126,400	117,300	105,700
Copper ore ²	1,800	1,700	2,000
Pyrite	612,300	570,000	470,000
Iron ore	18,320,000	17,984,000	18,063,000
Iron ore ⁴	4,826,000	4,745,000	4,788,000
Potash salts	16,200,000	16,664,000	17,432,000
Potash salts ⁵	1,986,000	2,017,000	2,145,000
Salt	3,587,000	3,573,000	3,648,000
Bauxite	4,736	3,839	4,504
Graphite	11,369	10,900	N.A.
Fluorspar	135,433	124,328	N.A.
Barite	428,662	434,395	N.A.
Feldspar	169,962	166,939	N.A.
Soapstone	15,659	15,691	N.A.
China clay	363,139	361,049	N.A.
Fuller's earth	244,209	250,092	N.A.
Mica	22	13	N.A.

1. Preliminary figures, excluding Saar. 2. Recoverable metal content. 3. Including recoverable zinc content of Pyrite. 4. Iron content. 5. K₂O content. N.A. Not available.

France

Iron ore output in France in 1959 increased 2.5 percent over 1958, to reach 60,897,000 tons and place the country third in world iron ore production, following the United States and the U.S.S.R. The steel industry in France, as well as in other European countries, continued its growth, with a total output of 12,500,000 tons of raw pig iron, compared to 12,000,000 in 1958. Production of raw steel exceeded 15,000,000 tons, for the first time. Exports of all three exceeded those in 1958.

The potassium mines in Alsace reported their record production of 1,660,000 tons and continued modernization and expansion programs. Bauxite almost equaled its 1958 record (1,742,000 compared to 1,798,000 tons), while production of calcined alumina reached 567,000 tons. The country's consumption of bauxite was about 1,400,000 tons, used mainly for producing aluminum, which totalled 172,960 tons in 1959. Magnesium output also increased.

As far as copper is concerned, French output is insignificant, and there is no treatment plant in France; however the production of electrolytic copper reached 27,700 tons, as against 23,800 in 1958. Nickel production, after treating the mattes from New Caledonia, is increasing slightly.

There was little production of manganese ore. France produced 24,870 tons of zinc ore at about 63 percent and 28,960 tons of lead ore at 55 percent; forecasts are about the same for 1960. Metallurgy has obtained, mostly after treating imported ores, 69,800 tons of lead and 147,200 tons of zinc (even allowing for small exportation to Portugal). As far as ferroalloys are concerned, production of ferrochrome is increasing and export is requiring larger quantities. Ferrosilicon production remains stationery, but with starting of new works, the outlook is better for 1960. A new important French activity is the manufacture of pure metals (beryllium, zirconium, niobium, manganese, tungsten, vanadium) for electronic and nuclear purposes.

Many exclusive research permits for metalliferous deposits have been granted and research for uranium continues active.

The forecast for 1960 looks favorable:

Mineral and Metallurgical Production in Metric Tons in France for 1958 and 1959

Commodity	1958	1959
Iron ore	59,455,000	60,897,000
Pig iron	11,970,000	12,472,000
Raw steel	14,606,000	15,210,000
Bauxite	1,798,000	1,742,000
Calcined alumina	524,000	567,000
Aluminum metal	169,000	173,000
Antimony regulus ¹	2,051	1,874,000
Silver ²	44,867	58,851
Bismuth ³	56.4	60,300
Copper metal ⁴	23,800	27,700
Cobalt metal ⁵	401	307
Magnesium ⁶	1,739	1,758
Refined nickel metal	6,500	6,600
Gold ^{2,4}	10.0	9.0
Lead metal	70,600	69,800
Zinc metal	149,900	147,200
Tungsten ore ¹	907,000	774,000
Ferrosilicon (50% Si)	97,000	90,000
Asbestos ²	18,600	24,000
Potassium ⁶	1,664,000	1,659,000
Pyrite	332,600	294,400

1. Tons. 2. Kilograms. 3. Cathodes. 4. Does not include gold produced elsewhere from mattes and then imported, nor gold obtained after treating imported ores. 5. Merchant asbestos. 6. Net hoisting estimated as KUO.

the technical development in the mines and the beneficiating of ores in new, up-to-date concentrating plans all point toward an expansion in siderurgy. Electrometallurgy, on the other hand, should benefit from the increased demand for additional metals such as chrome, nickel, molybdenum, etc. and light metals.

German Democratic Republic

Official figures for Eastern German mining and metallurgical production covering the years from 1955 to 1958 were released as shown in table. All 1959 figures are MINING WORLD estimates.

Italy

Difficult selling in the international markets for some metals was reflected in the 1959 Italian mining production.

In the mercury producing area of southern Tuscany the existence of a large stockpile (80,000 flasks) and the need for lower production costs forced some labor reduction at the Abbazia San Salvatore mine. This caused a long series of strikes and non-cooperation periods, resulting in a marked reduction in ore production.

In spite of this, exploration was carried on underground, where unknown ore bodies were located at deeper levels, as well as from surface, by means of geophysics and rotary drilling. Ore bodies were also found at the Selvena mine. No favorable results came from the exploration at the Vallalta mine in northern Italy. At the Cerreto Piano mine a new Pacific Foundry Company's furnace began to treat the richest ore.

Pyrite production (mostly from western

Tuscany) was more or less at the same level as in 1958; however, there were further difficulties in sales and the stockpile accumulated at the mines increased from 180,000 to 225,000 tons.

In 1959 the Ferronin Company started sinking two shafts in the Monte Argentario area (Poggio Mortaio mine) where large masses of pyrite and magnetite had been found by magnetometer exploration and by drilling. The two shafts had reached, at the end of the year, depths of 450 and 480 feet respectively (corresponding to 140 and 86 feet below sea level).

A certain improvement was noticeable in the operation of zinc mines, due to the higher prices of this metal. Production increased at the Salafossa mine, near Belluno (northeastern Italy), where some 1,500,000 tons of ore were developed; the grade is about 1 percent lead and 5.0 to 6.0 zinc. Ore will be mined by room and pillars with systematic roof bolting.

Most of the exploration for uranium was dropped in 1959. However, a few projects continued, mostly in the Giudicaria and Rendena valleys (northeastern Alps). One of the small deposits is considered to be commercial and will be operated by the state-owned Somiren Company, belonging to the ENI group.

A new barite mine was opened at Buca della Vena, near Lucca (Tuscany). In the Central Alps area, talc production was improved by the introduction of selective flotation, that allows the recovery of valuable byproducts (magnesite and iron pigments).

A large molybdenum discovery was reported from northern Sardinia, in the area of Ala dei Sardi where, according to the news, several million tons of medium-grade ore would be available. Further analyses, however, are reported to indicate much lower, non-commercial grades for the disseminated mineralization.

Potash exploration went on in Sicily

Eastern German Mine and Metal Production From 1955 through 1959

Commodity	1955	1956	1957	1958	1959 ¹
Iron ore ¹	1,664,000	1,757,000	1,478,000	1,506,000	1,550,000
Copper ore ²	1,333,000	1,350,000	1,393,000	1,457,000	1,545,000
Potash salts ³	1,552,000	1,556,000	1,604,000	1,650,000	1,705,000
Pyrites ⁴	49,000	54,000	54,000	52,000	50,500
Pig iron ⁵	1,517,000	1,574,000	1,663,000	1,775,000	1,850,000
Steel ingots ⁶	2,508,000	2,740,000	2,895,000	3,043,000	3,275,000
Sulphur ^{2,6}	95,493	94,236	101,798	106,359	110,000
Alumina ^{2,6}	46,239	54,988	49,658	51,484	52,000

1. Estimated. 2. Metric tons. 3. As K₂O. 4. As metric tons of sulphur. 5. Includes byproducts. 6. Calcined Al₂O₃.

Italian Metal and Mineral Production in Metric Tons in 1952, 1953, 1954, 1956, 1957, 1958, and 1959

Commodity	1952	1953	1954	1956	1957	1958	1959
Bauxite	282,912	248,947	295,082	259,712	261,111	299,030	301,129
Antimony ore	4,478	2,343	1,973	1,537	677	636	843
Iron ore	790,237	991,294	1,065,183	1,594,769	1,565,117	1,282,656	1,238,390
Manganese ore	81,190	78,384	76,310	46,015	47,002	43,373	52,013
Mercury ore	—	197,498	232,055	343,588	364,717	294,210	245,714
Lead conc.	64,665	66,219	69,125	81,825	87,046	94,098	84,242
Zinc conc.	234,411	223,928	240,686	247,617	265,525	276,602	274,498
Copper conc.	—	1,046	4,166	2,118	1,849	3,070	2,662
Asbestos fiber	23,941	20,281	23,546	30,753	34,287	35,949	43,500
Barite	56,274	71,762	71,898	92,334	99,290	93,159	95,000
Fluorspar	59,125	75,790	77,148	124,208	144,165	139,976	154,500
Pyrite	1,141,417	1,234,566	1,231,700	1,308,591	1,469,577	1,513,716	1,532,140
Sulphur	236,439	223,061	204,040	195,208	194,340	161,211	122,000
Graphite	N.A.	N.A.	N.A.	N.A.	N.A.	4,010	3,100
Gold, metal	N.A.	N.A.	N.A.	N.A.	N.A.	0.127	0.099
Silver, metal	N.A.	N.A.	N.A.	N.A.	N.A.	41,500	28,624
Talc	80,336	80,282	—	92,852	91,766	108,754	105,000
Aluminum, metal	52,830	55,463	57,572	63,409	66,500	64,050	100,440
Lead, metal	34,931	37,944	37,331	39,116	39,400	48,001	44,372
Zinc, metal	54,851	60,068	66,800	73,560	74,400	71,335	73,950
Mercury	57,740 ¹	51,330 ¹	54,340 ¹	2,135	2,200	2,024	1,540

1. Flasks. N.A. Not available.

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with development of commercial mines in the final phase. Total proved reserves are estimated in the order of several hundred million metric tons of ore, the grades being over 10 percent K_2O . The San Cataldo mine, owned by the Montecatini firm, was producing some 500 tons per day from development work and in a few months should produce 3,000 tons per day of 12 percent ore. Ore will be beneficiated to 17 percent K_2O by flotation at the mine and the concentrate treated in the Castelfranco plant. The San Cataldo mine will be equipped with Joy continuous mining equipment.

Also, the Pasquasia mine, owned by the Trinacria Company (Italian Edison group) was being developed and is expected to start production in 1961.

Native sulphur production from Sicily and from the Italian Peninsula remained low, due to the high, non-competitive cost of underground mining. Sicily's sulphur industry will probably be further influenced by the expected sulphur recovery from the heavy oil of Gela (southern Sicily) where the Anic Company (owned by the state agency E.N.I.) plans the construction of a large petrochemical plant. Influence of the European Common Market, under which the present government assistance to the sulphur producers should come to an end, will also call for reductions in the sulphur output.

Norway

Total mine production volume decreased for the second year, and production value even more. The picture was spotty; mines do not expect a general expansion in 1960. Contrarily, smelter production volume and value increased materially and most smelters enjoyed a record year in 1959.

Iron ore mines increased production slightly, but the value decreased because the iron ore prices were cut sharply for 1959. The low prices will prevail in 1960, but the mines are hoping for better prices in 1961 on account of the economic upturn in Europe.

A/S Sydvaranger which has produced 1,100,000 annual tons of iron concentrate the last three years, will increase production to 1,300,000 to 1,400,000 tons in 1960 by seven-day-weekly operation of the mill.

The all flotation iron ore pilot plant

at Rana will be enlarged by sections for jigging, wet, and dry magnetic separation in order to evaluate the different mineral dressing possibilities for the complex ore. The plant capacity will increase from 20,000 tons of concentrate in 1960 to 60,000 tons in 1961. Fosdalen iron ore mine decided to start work on sinking a 1,200 meter (4,000 foot) deep main shaft to develop the ore body they have located.

A/S Titania's 1,000,000-ton-a-year ilmenite open pit mine and mill at Tellnes will start production in the summer of 1960.

Christiania Spigerverk was investigating a low-grade iron ore deposit at Andorja Island in northern Norway, and a decision is expected in 1960 regarding production.

Diamond drilling of the copper deposits in the Kautokeino district proved some million tons of 2.0 percent Cu. An exploration drift is planned for 1960. Plans for an operation are well ahead for a copper output of 150,000 tons-a-year.

Christiania Spigerverk decided to build a 25,000 annual ton plant at the nepheline syenite deposits at Stjernoy in northern Norway. The plant will start production in 1961. A/S Olivin, which mines the olivine deposits at Aaheim in western Norway, will build a plant for production of "forsterite" firebricks in cooperation with German ceramic interests.

Pig iron and steel production increased markedly due to expansions at Rana and Bremanger, and even higher production is expected in 1960. The ferroalloy production picked up from 1958, but is still below the record year 1957, and far below capacity.

The expansion of aluminum production continued with new records every year. "Norsk Hydro's" magnesium plant at Heroya started work on an expansion to 14,000 tons a year effective in the summer of 1960.

Copper, nickel, and zinc production chalked up new records in 1959, while sulphur production decreased somewhat due to market difficulties.

Portugal

The Portuguese mining industry did not have a good year in 1959.

The low price crisis in the wolframite mines was maintained and affected severely

Mine and Smelter Production in Metric Tons in Norway in
1956, 1957, 1958, and 1959

Commodity	Percent Average Grade	1956	1957	1958 ¹	1959 ²
MINE PRODUCTION					
Iron ore and conc.	64.5 Fe	1,550,000	1,548,000	1,600,000	1,610,000
Ilmenite conc.	44 TiO ₂	191,000	210,000	212,000	210,000
Pyrite ore and conc.	—	853,000	844,000	793,000	750,000
Copper conc.	21 Cu	27,800	30,000	30,000	28,000
Zinc conc.	49 Zn	12,200	14,100	17,000	18,000
Lead conc.	65 Pb	1,300	1,400	3,000	4,000
MoS ₂ conc.	90 Mo	290	320	300	300
Columbium conc.	50 Cb ₂ O ₅	260	240	300	200
Graphite conc.	80 C	5,000	5,700	4,500	5,000
Coal	—	390,000	384,000	288,000	240,000
SMELTER PRODUCTION					
Pig iron	—	191,000	245,000	260,000	320,000
Steel ingots	—	290,000	350,000	371,000	410,000
Ferrosilicon	45 Si	108,000	151,000	124,000	130,000
Other ferroalloys	—	153,000	169,000	139,000	160,000
Aluminum	—	99,000	96,000	126,000	150,000
Magnesium	—	7,400	8,600	9,000	10,000
Copper	—	15,400	15,700	17,600	19,000
Copper matte	35 Cu	13,400	13,700	13,000	13,000
Nickel	—	19,400	21,100	24,000	26,000
Zinc	—	49,000	48,000	46,000	52,000
Sulphur	—	97,000	97,000	91,000	87,000

1 Preliminary. 2. Estimate.

most of the mines with the exception of the Panasqueira mine where low costs allow current operations. The same applied to the mines producing both wolframite and tin.

With regard to the tin mines, there was also a smaller production owing to the more and more difficult exploration of the veins at those mines with a long history. Output was lower, also, because of the exhaustion of the alluvial placers which formed a great part of the total production.

The Panasqueira, Ribeira, Argoselo, and, most recently, the Montezinho mines, are the main ones which, in great part, will guarantee the future of Portuguese mining.

Though the production of the pyrite mines did not decrease during 1959, the difficulties of marketing increased owing to the competition of the sulphur from the Lacq mines, in France.

The gold production came, exclusively, from the Jales mine (Vila Pouca de Aguiar).

With regard to the iron mines, there was an increase in hematite production which was exported in great part to Germany.

In the metallurgical industry, at Vila Cova, where electric pig-iron is produced from magnetite, production was increased. The company is trying to increase ore reserves in order to enable it to make plans for a larger output of pig iron.

Production of Metals and Minerals in Metric Tons in Portugal in 1957, 1958, and 1959

Commodity	1957	1958	1959
Arsenopyrite	7,941	6,438	526
Beryl	173	147	17
Sphalerite	303	0	1
Cassiterite ¹	1,762	1,953	1,407
Columbite-tantalite	32	24	6
Galena ²	2,246	1,473	82
Hematite	188,470	135,152	151,553
Kaolin	48,012	59,745	43,905
Magnetite	97,912	96,980	89,073
Manganese ore ³	5,475	4,975	7,046
Pyrite	668,768	598,166	631,546
Scheelite ⁴	256	84	83
Wolframite ⁴	3,727	1,681	1,926

1. 65 percent Sn. 2. 65 percent Pb. 3. 42 percent Mn.

Sweden

Iron ore production and export from Sweden, which showed a noticeable downward trend during 1958 and the first part of 1959, recovered sharply during the last half of the year.

For 1960, export is calculated to reach at least the figure of the record year 1957, and will perhaps exceed it.

LKAB during 1959 produced 10,800,000 tons at Kiruna and 2,800,000 tons at Malmberget; at Kiruna, the production from underground mining was 60 percent of total. Of the production at Malmberget, 117,000 tons were concentrate and 125,000 tons were pellets.

The sinking of the shaft and driving of headings, as well as machinery installation, continued at Kiruna. An inclined road, which has been sunk to 320 meters depth, will be used by buses.

In the new mill at Vitafors, Malmberget, the first section started in January 1960. The present extension stage gives an annual capacity of 600,000 tons of pellet concentrate, or 1,200,000 tons of coarse concentrate. In early 1960 the pellet sinter plant will start to operate to increase capacity from 140,000 to 300,000 tons yearly.

Grangesbergsbolaget's newly-opened mine in Strassa, which is planning for an

annual output of about 430,000 tons of iron concentrate, started during the Autumn and the present operations have yielded very satisfactory results. The planned pellet sinter plant was postponed. At the company's mine in Grangesberg, an experimental plant for flotation was built for treatment of waste product with recovery of hematite and apatite concentrates. The plant will also operate during 1960.

Stora Kopparbergs Bergslags AB's new mill at Grangesberg for iron ore concentrate will be operated for testing purposes during January 1960. At the company's iron ore mine in Tuna-Hastberg, the entire hoisting works was put into operation, thus completing the new Central Plant. 200,000 tons of ore-bearing rock will be hoisted yearly. The recently-blasted tunnels in Blotberget for conducting sea and purified waste water will be put in operation.

Stallbergsbolagen, Ludvika, during the first part of 1959 was obliged to cut down production at some of its iron ore mines, but through increased production at the Idkerberget and Forsbo mines succeeded in keeping total 1959 production at the same level as during the last two years—about 1,030,000 tons of ore. Investigation work was started in the company's mine at Klara in Narke; at the Vasman iron ore field in Ludvika preliminary investigations were made.

Norbergs Grufforvaltning's new mill at Balsjon, Norberg, is under construction with the installation of separators and shaking tables. A flotation department for finer hematite ore is being planned. The plant is calculated to produce yearly quantity of up to 300,000 tons of concentrate, which with flotation can reach 350,000 to 360,000 tons. It is estimated that the mill will be in operation by mid-1960. The 2.3 kilometer transport drift at a depth of 250 meters, included in the system of the new Central Plant, was finished to reach the Gustaf Adolfs shaft and Nygruvan mine.

Riddarhytte AB, at its new Central Plant at Backegruvan. Riddarhyttan, sunk a shaft from 150 to 300 meters, intended for ore and man-hoisting, with a capacity of about 400,000 tons of ore per year. Sinking of the shaft to a depth of 480 meters and the planned mill should be ready in 1961. The product is calculated at 160,000 annual tons of magnetite concentrate.

At Fagersta Bruk's iron ore mine, Rudgruvan, the "blind" shaft and hoisting shaft were sunk from 170 to about 340 meters and the new level is being completed, so the crushing station can be moved down from 125-level. This will be done at the end of this year. Concentrate output will thereby be increased from 30,000 to 50,000 tons per year.

At Boxholms AB's iron mines in Kantorp, a new central shaft has been raised from 154-meter level to the surface. A drift has also been driven to the shaft position at 350-meter depth so that the central shaft will be raised to the 154-level. The sintering works was modernized by enlarging pocket space, increasing the number of sintering pallets, and improving transportation arrangements for supplying materials. The central shaft's new shaft tower will be 68 meters high with crushing station and two Koepe hoists. At Stav, the shaft has been sunk from 123 to 240 meters, and sinking continues to 282 meters.

At SKF Hofors Bruk's mine, Mossgruvorna, the new dressing plant is in full operation, with a yearly capacity of 40,000 to 50,000 tons of iron concentrate. As the mining method requires a great quantity of long timber, the service cage was constructed of a width and length which

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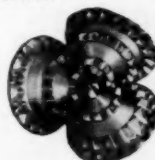
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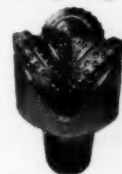
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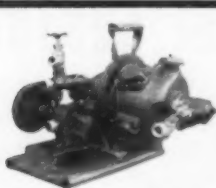
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would allow timber to be lowered into the mine on a truck. The loading arrangements underground are automatic, with belt conveyor. In the company's mine at Vingebäck, the pillars between shrinkage stopping are blasted with 5,000 kilograms of explosives.

In Tuolluvaara Gruv AB, the new shaft for material and passenger transport is scheduled to be sunk to 320 meters depth during the latter half of 1960, and to 500 meters during 1961. A 50-meter-high concrete shaft tower was erected over the shaft.

From AB Statsgruvor's Haksberg field, it was reported that connection was made between the central shaft and Kallbotten, so that ore from the six-kilometer-long field, from Iviken in the south to Kallbotten in the north, now can be transported underground to the central shaft for hoisting. In the company's mine in Norberg, a drift was driven to reach a point between the Eskilsbacke and Mimer fields. The buildings for the new plant at Mimer—a shaft tower, crushing building and mill building—were completed with installation of machinery started.

At Bolidens Gruv AB's sulphide mines, sinking of the central shaft started in the Renstrom mine. A 3.5-kilometer-long connecting drift between the Langsele and Langdals mines was started. Mining at Ostra Hogkulla mine has been finished. In the Kristineberg mine, preparatory work began at 410-meters depth; in the Ravliden field, investigation and preparatory work was made by sinking of the shaft to 430-meters depth.

Vassbo mine in Dalecarlia was completed. Mining will be a room-and-pillar system. Hoisting will be by skips with five tons of ore. After single stonegrinding in a 7-meter-diameter mill, the ore is concentrated by flotation. Mill capacity is 150,000 tons a year. The reserves are 3,000,000 tons with a lead content of six percent. A new central shaft was sunk to 355-meters depth at the Adak and Lindsfold mines. Blasting with ammonium nitrate has been tried with success at many of the company's mines. A modified gobbing with roof filling and waste sand was adopted at the Garpenberg and Kristineberg mines.

United Kingdom

Since the slump in base metal prices during 1957 and 1958, there have been no new mine developments in the United Kingdom and most of the mines which suspended operations at that time have not reopened.

Extensive geophysical, airborne radiometric, and magnetic surveys have been made. In Cornwall five virgin lodes containing uranium were located as a result of airborne survey and have since been examined by surface work and exploratory drilling. One body containing ore has been shown to extend to at least 80-foot depth and further drilling is planned. A number of other occurrences also show promise.

The China clay industry had an excellent year and the group profits of English China clays showed an increase from £2,538,182 to £3,284,294 for the year ending September 30, 1959.

The group is now closely connected with the building and road-making industry, having entered into the quarry industry by taking over interests in Devon in 1957 and the Croft Granite Company in March, 1959, and it seems

Europe

likely that some of this increased profit has been derived from these interests.

The production of lead and zinc has declined. Operation at Greenside mine situated at Glenridding near Lake Ullswater in the Lake district ceased toward the end of the year since existing ore reserves had been mined and no further extensions developed.

Although lead mining at the Halkyn District United Mines was suspended on April 18, 1958, production of high grade chemical and agricultural limestone from underground continued, but the 1958 report published in 1959 shows a loss of £15,760.

Nine tenths of the world's output of strontianite is produced in the United Kingdom, and the most important deposits are found in Gloucestershire and Somerset, principally near Yate where 500,000 tons has been mined in the past 80 years and the reserves appear to be substantial.

In Cornwall, the two major tin mines continue to maintain a good output. Although the 53rd annual report of South Crofty Ltd. issued last May showed a loss of £51,575 with a trading loss of £18,638, the rate of milling has been raised to the estimated level of 8,000 tons per month in the current year and the production of tin has been increased.

During the year reviewed in the 53rd report, 75,596 tons were milled, compared with 70,633 tons in the previous year while 741.75 tons of tin concentrate was produced although the grade fell from 23.04 pounds per ton to 21.98. On the other hand costs were reduced by nearly 3 per cent. For the first 11 months of 1959 however, no less than 878 tons has been produced.

The total footage driven was increased considerably and a further 1000 feet of diamond drilling was undertaken in comparison to that of the previous year. It was also confirmed in the report that an important ore body existed in the new northern lodes, and a wide lode with

good values was being explored elsewhere.

The other tin mine, Geevor Tin Mines Ltd., situated near the Lands' End in Cornwall showed increased profit in the report for the year ending March 31, 1959.

The report showed that the mine had milled 63,484 tons of ore yielding 683 tons of tin concentrate which was exactly the same quantity as was produced in the previous year.

The grade of ore milled remained remarkably consistent, averaging 24.1 pounds of tin concentrate per ton, whereas it was 23.97 last year. Development amounted to 8,567 feet which is quite satisfactory, and was carried out on seven ore bodies. The ore reserves at March 31 stood at 202,542 tons.

The production of tin by Hydraulic Tin Ltd. continued during the year from its enlarged plant. This company is recovering the values from a large accumulation of tailings from previous and long since abandoned mining operations.

Yugoslavia

Production of all metals, except aluminum and silver, increased in 1959. Lead, zinc, antimony, and electrolytic-copper production were the highest on record.

The Trepča smelters, Kosmet, produced 71,801 tons of refined lead (70,665 tons in 1958) from its own ore and from other mines in Serbia, Macedonia, Bosnia, and Montenegro. Besides lead, the Trepča smelters produced 88 tons of silver and 91 tons of bismuth. Lead-zinc ore has been developed at Žute Prline, Kopaonik Mountains—about 2,000,000 tons, containing 5 percent Pb and 4 percent Zn. At Blagodat near Bosilgrad, Serbia, an ore body containing 8 percent Pb and 7 percent Zn has been proven.

The Zletovo mines in Macedonia, 60 kilometers east of Skopje, are steadily

Metric Tons of Iron Ore Mined, Pig Iron and Steel Produced in Yugoslavia in 1939, 1952, 1953, 1954, 1955, 1956, 1957, 1958, and 1959

Commodity	1939	1952	1953	1954	1955	1956	1957	1958	1959
Iron ore	666,813	676,010	794,917	1,110,743	1,398,298	1,724,967	1,876,116	1,997,000	2,095,000
Pig iron	101,000	272,884	269,748	356,000	513,797	630,574	714,271	748,000	863,000
Steel	235,000	442,354	514,537	616,298	806,023	886,730	1,049,286	1,119,000	1,299,000

Metric Tons of Ore Mined in Yugoslavia in 1939, 1952, 1953, 1954, 1955, 1956, 1957, 1958, and 1959

Ore	1939	1952	1953	1954	1955	1956	1957	1958	1959
Lead-zinc	774,772	1,203,764	1,432,100	1,484,522	1,650,178	1,726,461	1,763,957	1,796,000	1,831,000
Copper	983,902	1,264,998	1,343,563	1,298,860	1,476,863	1,740,855	1,933,134	2,267,900	2,228,000
Antimony	18,963	74,594	61,450	75,258	80,474	83,056	85,547	75,524	96,138
Bauxite	718,594	577,196	462,309	680,597	791,057	881,418	888,240	733,000	815,000
Chromite	44,852	107,222	126,961	124,480	126,207	118,762	120,266	113,569	107,016
Manganese	5,656	N.A.	N.A.	N.A.	10,955	11,573	10,234	10,036	8,084
Pyrite conc.	78,064	N.A.	N.A.	N.A.	226,682	255,947	312,000	351,000	290,000

* N.A. Not available.

Metric Ton of Metal and Alumina Produced in Yugoslavia in 1939, 1952, 1953, 1954, 1955, 1956, 1957, 1958, and 1959

Metal	1939	1952	1953	1954	1955	1956	1957	1958	1959
Refined Lead	10,651	67,180	70,796	66,729	75,612	75,759	78,504	83,281	85,395
Zinc	4,918	14,463	14,549	13,644	13,767	14,003	29,459	31,248	31,951
Blister copper	41,043	32,819	31,190	30,295	28,260	29,384	33,735	33,672	35,251
Electrolytic copper	12,463	21,390	27,764	26,946	24,837	25,008	30,128	29,950	31,567
Antimony	1,500	1,329	1,410	1,552	1,605	1,663	1,769	1,665	2,281
Mercury	378	504	492	498	503	456	425	423	460
Aluminum	1,795	2,563	2,796	3,496	11,409	14,682	18,134	21,681	19,245
Bismuth	—	99	98	110	104	111	100	77	91
Silver	1	80	95	88	93	86	81	117	88
Alumina	7,141	NA	NA	NA	NA	48,206	50,236	54,000	57,000*

* Approximate

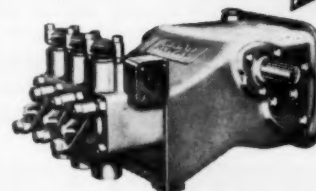
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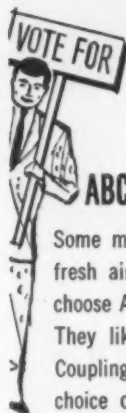
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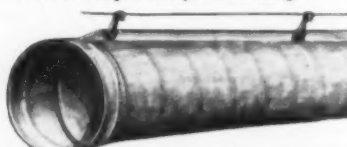
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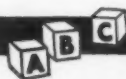


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increasing lead and zinc concentrate production. Further east, at Sase on the Ruen Mountain over 1,000,000 tons of ore (5 percent Pb and 5 percent Zn) have been found.

The Mežica lead smelters produced 13,594 tons of refined lead (13,616 tons in 1958) from its own concentrate. The use of rich and regular up-draught sinter brought blast furnace lead production to 20 tons per square meter. Short-drum furnaces smelt rich sinter and concentrates. Newnam-hearth smelting has been abandoned.

The production of zinc increased 2 percent compared with 1958. The smelters at Celje, Slovenia, produced 18,122 tons of zinc (17,656 tons in 1958) and the electrolytic zinc plant at Sabac, Serbia, 13,829 tons (13,592 tons in 1958). Also, approximately 30 tons E-cadmium have been produced at Sabac. The Celje smelters are installing a Fluosolid plant and the second sulphuric acid plant. The Sabac plants are being enlarged by 50 percent.

At Mojkovac, Montenegro, a big deposit of zinc ore has been ascertained. The possibility of the erection of a zinc electrolysis in Montenegro is being discussed.

Copper ore output from the mines at Bor, Serbia, decreased, but copper production increased 5 percent. Bor also produces some silver, gold, and selenium. The reconstruction of the Bor smelters is well under way; it is expected to change in 1961 from blast-furnace to reverberatory smelting. Also the sulphuric acid plant should be finished in 1961 as well as the superphosphate plant at Prahovo on the Danube.

The Majdanpek mines, north of Bor, are being prepared for a daily production of 6,000 tons of ore starting in two years. Waste stripping is done by the largest shovels and trucks ever used in Europe.

Pyrite concentrate production decreased 14 percent. Over 80 percent was produced at Bor, the rest at Trepča.

Antimony ore production increased 27 percent, metal production was up 37 percent, overreaching all previous records. The increase was due to the enlarged flotation plant at the Stolice mine, Serbia.

Mercury production was 9 percent higher than in 1958 and also higher than 1957 and 1956. New ore has been found. A 250 ton per day rotary kiln was ordered in Italy to replace the antiquated shaft furnaces and to increase production.

Bauxite output increased 11 percent. Unknown deposits have been found in different places. Alumina production increased 5 percent.

Aluminium production decreased 11 percent. Kidričevo, Slovenia, gave 14,328 tons (17,038 tons in 1958). The rest came from Lozovac and Ražine, Dalmatia. Drought in October necessitated stopping the Kidričevo electrolysis entirely which caused a loss of over 4,000 tons of aluminium during October, November, and December. The reconstruction of the aluminium plant at Kidričevo (continuous Bayer-Péchinev process) is well under way. It should be finished in one year and a half, the capacity of the plant then reaching 100,000 tons alumina per year.

Chromite production decreased 6 percent. Nearly all is used in local factories for refractory brick and for ferroalloys.

Iron ore output increased 5 percent, pig iron production 15 percent, and steel production 16 percent.

Haiti

Sedren S. A., the wholly owned subsidiary of Consolidated Halliwell Limited (Canada) continued all through 1959 in exploration and development of its 100 square mile concession area in the Terre Nueve district.

Prospecting and field investigations were carried on until the entire concession area had been thoroughly covered. Surface reconnaissance geological mapping followed on the more promising mineralized areas outside the Meme ore zone.

Diamond drilling was almost entirely underground for detailing the Meme ore zone; 15,500 feet of underground diamond drilling has been done to date.

Underground development was confined to the Meme ore zone by driving drifts, crosscuts, and raises to prepare stopping areas on the 1500 and 1330 levels, and to interconnect the three adit levels. The internal shaft was completed and sunk to over 300 feet below the 1500 level and development work on the 1700 level started. Total horizontal development now amounts to 7,073 feet. Raises to date have a total combined footage of 2,588 feet. Development preparations underground to provide a production of 1,500 tons daily are on schedule.

All necessary access and service roads at Meme and wharf site have been completed; total of 23 kilometers.

Drawings and designs for construction of the concentrator and crushing plant, as well as ancillary shops and services, were completed. Progress in pouring of concrete for both crushing and milling plant has proceeded so that steel building erection and equipment installation is starting. A production start-up around May 1960 can now be visualized.

Erection of all steel buildings for permanent power plant, machine shop, and mine dry were completed. Housing for staff personnel also finished.

Practically all equipment and machinery for mining and milling plant was received and unloaded at the Sedren wharf site. Installation of this equipment is proceeding as progress in construction permits.

Wright Engineers of Vancouver, British Columbia are the design engineers who are working in conjunction with Denver Equipment Company of England which is supplying the entire plant and is responsible for its construction.

Jamaica

In 1959 Jamaica continued to maintain its leadership as the Free World's major bauxite producer and exporter. There was only a slight decrease in ore exports as compared with 1958, but on the other hand alumina exports showed a slight increase.

According to the figures compiled by the Jamaican Mines Department the exports of kiln-dried bauxite amounted to 4,883,902 long tons (4,196,793 tons of moisture-free ore), 5,589,718 tons in 1958.

As in previous years the ore was exported to the United States by the two major producers—Reynolds Jamaica Mines Ltd. and Kaiser Bauxite Company. In addition to these exports 928,486 tons of bauxite (dry basis) were mined by Alumina Jamaica Ltd., for processing into alumina in the companies' local alumina plants. A total of 399,209.7 long tons of alumina was shipped, mainly to Kitimat, Canada.

The most important event during the year was the coming into operation, in October, of the Ewarton alumina plant owned by Alumina Jamaica Limited. The rated capacity of this plant is 240,000 tons per annum which, together with the Kirkvine alumina plant owned by the same company, makes the total rated capacity for alumina production in Jamaica 725,000 tons per annum. When in full production at rated capacity the plants will consume a total of 1,740,000 tons of bauxite (dry basis) per annum or just over 2,200,000 tons of bauxite as mined.

The completion of the Ewarton plant brings the company's total investment in Jamaica to over £40,000,000.

Development work for further extension of bauxite industry continued and Kaiser Bauxite Company proceeded with its program of constructing another shipping port at Discovery Bay, on the north coast of the island.

The company began construction of a four mile railroad in June to join its Friendship property to the main Kaiser railroad at Comfort. The addition of these four miles will bring the total length to 21 miles. Completion is expected in June, 1960 when the property will be needed for mining.

The company also carried out survey and engineering studies of possible transport routes over its properties on the North Coast as part of the long term planning.

During the year Reynolds Jamaica Mines Limited maintained a steady production equal to that of 1958 when increased drying, transporting, and shipping facilities raised production to double that of 1957.

In July of 1959 Aluminum Company of America entered into an option agreement with the American Metal Climax Inc. supplemented by an agreement with the Jamaican Government, making certain indicated bauxite lands in Clarendon Parish available for bauxite evaluation purposes. In August, 1959 Alcoa commenced its staking and drilling activities within the 50-square mile area covered by the agreement in an effort to indicate whether or not there is a sufficient tonnage of commercial grade bauxite available for a mining operation. Alcoa, in addition to its intensive prospecting and sampling operation, is making laboratory tests and conducting engineering and planning studies for a mining site and transportation facilities. The evaluation program is expected to be completed on or before May 1, 1960.

Harvey Aluminum of America continued limited prospecting operations on government-owned lands in the parishes of St. Elizabeth, Westmoreland, Hanover, St. Andrew, St. Mary, Clarendon, St. Thomas, St. Ann, St. Catherine, and Trelawny. Its current licenses include three renewals and

six new grants covering an area of 642 square miles.

After the 1958 boom gypsum production came back to its normal level and the annual output of Jamaica Gypsum Company Ltd.'s gypsum mines at Bull Bay amounted to 385,567 long tons of crushed gypsum rock (599,591 tons in 1958).

Excelsa Products Limited resumed mining operations of phosphates in the Portland Ridge Caves in Clarendon during October 1959. The decreased demand for the product had curtailed activity.

Prospecting for other minerals was carried out by seven companies, the Industrial Development Corporation, and four individuals.

At the year's end there were current 65 Exclusive and Special Exclusive Prospecting Licenses for iron ore, manganese, copper, quartz sand, pottery clays, marble, and bauxite.

There are only two current Exclusive Prospecting Licenses for iron ore and these were held by Jamaica Copper and Iron Limited.

There were 29 current Exclusive Prospecting Licenses for copper, 19 of them being held by Jamaica Copper and Iron Limited. Geological mapping and the compilation of geophysical information have been carried out on some areas.

Production of Minerals in Jamaica in Long Tons by Years from 1952 through 1959

Year	Kiln Dried Bauxite	Alumina	Gypsum	Phosphate, Kiln Dried
1952	340,419	—	N.A.	N.A.
1953	1,154,172	28,732	N.A.	707
1954	2,043,786	106,366	159,877	714
1955	2,645,345	183,968	83,155	477
1956	2,141,688	207,333	124,876	384
1957	4,596,028	435,752	189,161	100
1958	5,721,990	373,108	599,591	137
1959	5,125,603	399,210	385,567	40

N.A. Not available.

Puerto Rico

Prospecting for copper was the highlight of the mineral industry in Puerto Rico in 1959. The Bear Creek Mining Company (Kennecott Copper Corporation) and the Caguas Copper Company were most active. Geological exploration, geochemical surveys, and diamond drilling were carried out. It is known that extensive copper mineralization was discovered.

Several other mining companies hold mining concessions and speeded up their mineral surveys.

During the past several years no metals have been produced, but mining of non-metals has expanded both in value and tonnage. Cement, stone, sand and gravel, clay, and salt were the most important mineral products in 1959. Their total value, including other non-metals, was \$18,782,000 in 1959.

Burma

Burma Corporation (1951) Limited increased output of silver, lead, zinc, and copper during 1959, but their value declined from that of 1958.

Tin concentrate exports from the Tavoy and Mergui mining districts declined, but wolframite exports were up.

There were major changes in ownership of the mines. Two London companies, the Tavoy Tin Dredging Corporation Ltd. and the Consolidated Tin Mines of Burma Ltd., went into voluntary liquidation. Their mines and mining assets being acquired by indigenous mining concerns. The Mawchi mine remained closed during the whole year. The Burma government closed down all its mining operations and all prospecting activities and investigations by the Mineral Resources Development Corporation.

The Military Government with successes over the insurgents added enormously to the security in the country, and brought living conditions almost back to normal.

Dredging for tin is now practically extinct. Only one small dredge is now working in the Tavoy district and none in the Mergui district. Previous to the Japanese invasion the combined tin concentrate output from dredging in the two districts was over 2,000 tons per annum. With the exception of the Anglo-Burma Tin Company Ltd. the methods for tin and wolframite have not changed for the past 40 years nor is there any improvement in economics and in methods of production, but labor costs have increased over threefold as have mining tools and supplies.

The Burma Corporation continued to be one of the world's largest silver and base metal producers. More than 2,900 men are employed at the mines, flotation mill, and smelter in the Shan States. Ore reserves as of 1 July 1959 were reported as 2,096,712 metric tons assaying 15.7 ounces silver, 20.7 percent lead, 12.6 percent copper per ton. Throughout the year milling capacity was in excess of mine output so periodically the feed was reduced or cut off until ore feed was available.

Exports of wolframite concentrates from Mergui were up to 188.85 metric tons from 26.80 in 1958 due to the increased output of the Yadanabone mine. It was closed, however, by the Resources Development Corporation which was the operator.

Ceylon

Graphite mining continued to be the principal mineral industry of the Island.

Production of Metals and Minerals in Burma For Key Years From 1939 to 1959

Year	Silver ¹	Tin Concentrate ²	Wolframite Concentrate ³	Lead ³	Zinc Concentrate ⁴	Copper Matte ⁵
1939	6,175,000	5,441	4,342	77,180	59,347	7,935
1948	415,099	1,768	378	14,596	2,943	115
1949	75,199	1,469	278	1,481	—	38
1950	—	1,750	165	371	—	—
1951	280,270	1,295	483	5,035	—	254
1952	54,783	1,306	792	9,093	4,275	134
1953	645,970	1,114	767	9,846	6,275	85
1954	1,278,289	816	443	22,561	11,283	224
1955	1,537,895	673	578	28,015	14,423	358
1956	1,358,513	1,193	1,438	14,885	13,953	379
1957 ⁶	1,238,259	1,140	948	13,892	14,922	269
1958	1,206,339	1,752	601	13,577	17,772	256
1959	1,831,724	1,745	787	20,823	20,520	381

1. Ounces. 2. Metric tons. 3. Long tons. 4. 1,788 tons mixed wolframite-tin concentrates exported. 5. 143 tons mixed concentrates exported. 6. Estimated.

The year was one of quiet activity. There was a welcome increase in the volume of exports during the year. The lower grades which formerly were completely out of the market due to high prices were once again on offer due to a cut in price following a reduction in the export duty toward the close of the year. The industry thus passed through one of its most difficult phases and everyone looks forward with optimism to the future. The large mines stepped up production to meet the increased demand.

The principal graphite mines continued to be worked by Bogala Graphite Ltd., Khatagaha Mines Co. Ltd., and H. L. De Mel & Co. Ltd.

Gem stone mining continued throughout the year. The estimated annual production of gem stones is valued at about Rs 1,500,000. The principal varieties are the ruby, sapphire and its star varieties, cats' eye, zircon, topaz, aquamarine, and moonstone.

The experimental plant for the recovery of monazite from beach sands concentrate continued to work throughout the year. A stock pile of about 500 tons of No. 2 grade monazite assaying 70 per cent rare earth oxides was produced. An Exolon magnetic separator, a Kipp-Kelly airflow table, and a grader were installed and the production of No. 1 grade monazite will be commenced early in 1960.

Ceylon Graphite Exports From 1951 Through 1959 In Long Tons.

Year	Quantity
1951	12,621
1952	7,659
1953	7,218
1954	7,755
1955	9,878
1956	9,207
1957	8,190
1958	5,637
1959	7,872

Hong Kong

The mining industry of Hong Kong maintained its 1958 production rate in 1959.

The Ma On Shan iron mine increased its average monthly output to about 10,000 tons. The average iron content of the ore is 32 percent. This is concentrated in a wet magnetic separator to 56 percent. This separating plant can treat 700 tons of crude ore daily. The entire production of 120,000 tons of concentrate was shipped to Japan.

The production of graphite continued at about 150 tons monthly. Until 1959 only grades above 80 percent, fixed carbon, could be marketed. The ore is hand graded. In 1959 a market was found for

1,358 tons of the low grade graphite (average 50 percent fixed carbon content.) The only mine worked is on West Brother Island. It is entirely underground.

The continued low price of tungsten kept wolframite mining to a minimum. Only one mine at Needle Hill operated with a skeleton staff. The Yan Hing Mining Company still has faith in the future of tungsten and was steadily stockpiling output.

Production of Metals and Minerals in Hong Kong, 1957 through 1959

Commodity	1957	1958	1959
Iron ¹	94,182 ²	105,125 ²	119,892 ²
Lead ¹	130	36	—
Graphite ¹	3,305	1,934	1,924
Kaolin and clay ¹	6,961	7,620	7,256
Quartz ¹	—	4,484	3,571
Feldspar ¹	—	1,653	1,716
Wolframite ¹	—	—	39

1. Metric tons. 2. Concentrate.

No lead was mined. An announcement was made that Mountain Lead Mines Ltd. started proceedings against the Hong Kong government for compensation in respect of the government's action in refusing to renew its prospecting license.

Kaolin output was over 7,000 tons for the year. Most of this production came from the pit at Cha Kwo Ling. Interest in the beryl deposits is still shown by inquiries from Canada and the United States.

India

Development of new iron mines and erection of steel mills were the major items in India's mining scene in 1959. Blast furnaces and open hearths were commissioned at Rourkela, Orissa; Bhilai, Madhya Pradesh; and Durgapur, West Bengal.

An Iron & Steel Advisory Council was set up to advise on all matters of production, distribution, transport, research, import, and export. A proposal was finalized to set up one more steel plant at Bokaro in Bihar. The United States is likely to aid in building this plant with an initial capacity of 1,250,000 tons; it is to be doubled subsequently. The United States is to provide about \$630,000,000 for financial and technical assistance on the ISCON pattern through a United States Steel Consortium.

Mechanization for handling nearly 3,000,000 annual tons of iron ore from the Barasua mine about 52 miles southeast of the Rourkela steel plant was nearly completed. From 3,000,000 tons of iron ore mined annually 2,000,000 will be lump size, and 1,000,000 will be fines. The fines will be sintered at the mines site. A composite of sintered fines and lump ore will provide an average blast furnace feed containing 60.3 percent Fe. Supply of ore for Durgapur steel plant will come from an area near Panposh Gorge, Keonjhar district, Orissa. The ore will be mined and supplied by the newly formed Bolani Iron Ore (P) Ltd. Another iron ore district—Kiriburu situated on the border of the Keonjhar district, Orissa, and the Singhbhum district of Bihar was being developed mainly for export of iron ore to Japan. It will produce 2,000,000 tons of iron ore per year.

Japan concluded an agreement to import 2,200,000 tons of iron ore from September 1959 to August 1960. The

basic selling price recommended remains the same at 80 shillings per ton.

Two copper prospects at Khetri in the Jhunjhunu district, and Daribo in Alwar district, Rajasthan, were explored by the Indian Bureau of Mines. A reserve of 28,440,000 tons of 0.8 percent copper was proved in the Khetri area. An appreciable amount of ore assaying 2.5 percent copper was also blocked out in this area. The exploratory work was supervised by a UNO expert, Mr. Kerr-Cross. A license to put up an 8,500 annual ton electrolytic copper refinery near Mosabani was granted to Indian Copper Corporation.

Another copper deposit at Gani in Kurnool district, Andhra Pradesh was being prospected in detail by the Indian Bureau of Mines in collaboration with Geological Survey of India.

Production of Important Minerals and Metals in India During 1958 and 1959

Mineral or metal	1958	1959
Iron ore ¹	6,130,000	7,829,000 ²
Manganese ore ¹	1,253,000	1,070,000 ²
Ilmenite ¹	314,000	303,000
Gold (bullion) ³	5,291	5,144
Silver (bullion) ³	3,416	3,881
Lead (metal) ¹	3,387	3,958
Zinc (concentrates) ¹	7,391	9,978
Copper ore ¹	411,000	404,000
Copper metal ¹	7,966	7,674
Aluminium (metal) ¹	8,316	17,357
Mica ¹	31,811	27,624
Kyanite ¹	26,026	15,758
Sillimanite ¹	14,067	7,860
Chromite ¹	63,957	85,000

1. Metric tons. 2. Provisional. 3. Kilograms.

Considerable progress was made in developing the bauxite mines at Lohardaga in Ranchi, Bihar. The Indian Aluminium Company built a 10,000 annual ton smelter at Hirakud, Orissa which went into production on February 12, 1959. A new firm, Hindustan Aluminium Corporation has been formed. It will build a plant with an annual capacity of 20,000 tons of aluminium ingot at Pipri village near Rihand Dam, Uttar Pradesh. The venture is sponsored by Birla Brothers in collaboration with Kaiser Aluminium and Chemical Corporation Ltd. of the United States which will subscribe 25 percent of the capital and provide technical know how. Hindustan Aluminium Corporation is the largest United States private investment to date in a joint venture with the Indian industry. It will start producing ingot by the beginning of 1962.

About 8,000,000 tons of bedded pyrite have been proved in Amjor, Bihar. The average sulphur content is 44 percent. Discovery of the deposit will meet much needed sulphur requirements of the country.

Iran

The Iranian mining world during 1959 was dominated by the discussions about the Azna Steelworks. Although these plans have been discussed for several years, no final agreement was reached with the suppliers and part-financiers, the German Demag-Krupp group. Late in the year, a Swedish group of consultants, Skandiaconsult, was appointed to study the plans and the report is to be submitted shortly. It is hoped that the contract will be signed during 1960. Meanwhile, exploration at the Shamsabad deposit, which is to supply Azna with

iron ore, continued and some 30,000,000 tons of high grade ore was proved.

Another question of great importance has been the matter of supplying the Iranian and neighboring oil industries with Iranian barite. Iran is importing about 35,000 tons of barite per year, and the total annual consumption in the Persian Gulf area is estimated at 100,000 tons. During 1959, there was a rush to search for barite deposits. There were rumors that an Iranian group signed a contract with a large United States barite company for the development of a quite important deposit in Iran. Italian and British companies were also reported to be interested.

The Government surveys of various areas were continued during 1959. Surveys for potash and sulphur were successful.

A German group investigated the promising Kirman area, and an Italian group was responsible for the surveys of Baluchistan. No final reports were submitted.

The private mining enterprises suffered at the beginning of the year not only from the low metal prices, but also because the biggest customer, the Soviet Union, did not renew purchase contract. The diplomatic tensions between Iran and the USSR were reduced late in the year and there was again export, mainly lead ores, to Russia. An example of the difficulties for private mines is that the largest lead mines in Khomein area, in which the French Penarroya Company has large interests, ceased production. Nevertheless, the total ore production shows a slight increase, and prospecting activity reached another peak during 1959.

Iranian Mineral Production in Metric Tons From 1956 Through 1959

Mineral	1956	1957	1958	1959 ¹
Lead ore ²	32,000	34,000	48,000	39,000
Zinc ore	8,000	11,000	7,000	15,000
Chromite ³	43,000	45,000	48,000	50,000
Manganese	18,000	16,000	15,000	6,000
Copper	4,000	4,000	4,000	4,000
Iron ore	—	8,000	10,000	22,000
Red iron, (ocher)	14,000	9,000	12,000	8,000
Coal	175,000	180,000	205,000	200,000

1. Estimated. 2. More than 50% Pb. 3. More than 40% Cr₂O₃.

Japan

Beginning in April the Japanese mining industry made a fast recovery in 1959 to coincide with industrial production and consumption. The index for mining and industrial production regained the level of the post-war peak of May 1957.

Production of several metals and minerals increased over 1958. Electrolytic copper output increased 56 percent and electrolytic lead gained 155 percent. However, as shown in table, the actual Japanese production of copper, lead, and zinc ores showed no appreciable increase. A large part of the difference being supplied from imported ores and concentrates which are smelted in Japan.

Imports of copper, lead, and zinc ores and concentrates have been gradually increased during the past several years. Copper concentrates imported were 85,000 metric tons (metal content) as compared with 48,600 in 1958. In zinc concentrates as well, importation of foreign output has been needed for covering the domestic demand for refined zinc.

During the fiscal year of 1959 (April, 1959-March, 1960), 31,000 tons of foreign zinc concentrates (metal content) will be imported. As to metals, electrolytic copper, lead, zinc, and silver were substantially imported during 1959.

In northern Honshu the Dowa Mining Company made a very important discovery near its Koska mine. An unknown ore body was discovered two kilometers south of the old mine. Ore is in a wide vein 170 meters below surface. Two types of ore, one silicious and the other with a barite gangue have been developed. Ore with barite is a mixed copper-lead-zinc sulphide with gold and silver. The silicious ore is copper.

Reserves of more than 4,000,000 tons have been indicated with exploration continuing. The company started a two-year development plan which entails shaft sinking and mine development, construction of a 20,000 metric ton per month mill, and enlargement of the shelter.

Nippon Mining Company discovered a copper deposit containing 2.0 percent ore at the underground Kuon mine in Hokkaido as a result of three years exploration. Reserves of copper ore have not been delimited as the company has been drifting on the 1,000-meter level since September.

In Hokkaido, Sumitomo Metal Mining Company also was developing both Hako and Uzen copper mines and confirmed about 2,000,000 metric tons of copper ore at the Hako and 1,000,000 at the Uzen. The company plans to install a mill at the site of both mines in the coming four years.

Nippon Mining Company expanded mining capacity of its Shirataki copper mine located in Kouchi Prefecture, Shikoku Islands, by 1,800 metric tons per month to 10,000 by the completion of shaft sinking during the year.

Due to discovery of copper deposits, Dowa Mining Company decided to increase capacity of the existing flotation plant at Hanaoka mine, which is near the Kosaka refinery, in order to meet increasing receipt of copper concentrates. After completion, Hanaoka mill can treat 35,000 to 40,000 tons of copper ore per month as compared with the present 15,000 capacity.

The Japanese copper producers increased their refinery capacity by 3,000 per month to 19,700 during 1959. The details are as follows:

Company and Smelter	December, 1958	December, 1959
Dowa Mining Co.		
Kosaka	1,422	1,500
Okayama	—	new plant 400
Nippon Mining Co.		
Hitachi	2,400	2,600
Saganoseki	2,100	3,100
Mitsubishi Metal Mining Co.		
Osaka	3,000	3,500
Furukawa Electric Industry Co.		
Nikko	2,614	2,650
Mitsui Mining & Smelting Co.		
Takehara	1,830	2,300
Sumitomo Metal Mining Co.		
Niihama	2,600	3,500
Toho Zinc Co.		
Annaka	500	500
Total	16,466	19,550

Outlook of non-ferrous metal market in 1960 is bright, but economic growth cannot be expected to continue at the 1959 pace. It is generally believed that there will be further expansion during

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Asia

1960. Mining and industrial production is expected to increase 11.8 percent.

In order to satisfy the growing economy, production of copper, lead, and zinc metals will be increased an estimated 10 to 14 percent above the 1959 figures.

Production of Metals, Ores, and Concentrates in Japan in 1958 and 1959

Commodity	1958	1959
METALS		
Gold ¹	9,594	10,208
Silver ¹	259,766	294,394
Copper, electrolytic ²	123,959	193,973
Lead, electrolytic ²	41,520	64,312
Zinc ²	140,978	159,312
Tin, electrolytic ²	1,328	1,328
Antimony ²	1,220	1,464
Quicksilver ²	376	556
Nickel ²	3,617	5,227
Cobalt ¹	—	1,000
Titanium ¹	1,656,052	2,476,646
Germanium ²	4,882,772	11,597,496
Magnesium ²	3,332,852	4,486,830
ORES (metal content concentrates)		
Gold ¹	8,107	8,027
Silver ¹	203,791	205,202
Copper ²	81,499	84,288
Lead ²	36,694	35,961
Zinc ²	142,973	141,285
Tin ²	1,126	1,009
Antimony ²	270	312
Quicksilver ²	204	217
CONCENTRATES		
Pyrite ore ²	3,358,590	3,423,034
Manganese dioxides ²	12,504	12,092
metallic ²	283,483	325,207
Chromite ²	41,871	57,071
Tungsten ²	683	928
Molybdenum ²	591	717
Titanium ²	5,331	5,652

1. Kilograms. 2. Metric tons. 3. Grams.

Malaya

Control of tin exports from the Federation of Malaya continued under the terms of the International Tin Agreement throughout 1959, but with lessening severity, a move which had been awaited by all producers and was especially welcomed by the smaller-scale Chinese operators.

Permitted exports for the year totalled 36,887 long tons compared with 34,875 from December 15, 1957—when restriction was first imposed—to December 31, 1958. For the whole two-year-plus period, Malaya actually exported a total of 71,729 long tons against permitted exports of 71,762 long tons, an underfill of 33 tons.

As can be seen from the accompanying table the easing of restriction resulted at the year's end in an overall increase of 13.7 percent in the number of tin producing units in Malaya—11 more dredges, two more European, and 57 more Asian gravel-pump mines.

Number of Active Tin Producing Units in Malaya, End of December 1958 and 1959

Method	1958		1959	
	European	Asian	European	Asian
Dredges	34	0	45	0
Gravel pumping	11	322	13	379
Hydraulic	6	3	6	3
Open cast	0	1	0	3
Underground	1	18	1	19
Other	1	20	1	16
TOTAL	53	364	66	417

On August 29, Malaya's tin producers completed their contribution to the Buffer Stock Fund, a total of \$55,440,671.95. Payments began on October 15, 1956.

Following the re-allocation by the International Tin Council of the export percentages for the six producing countries signatory to the Agreement, Malaya's percentage was raised from 37.50 to 37.75 as from July 1.

The year ended with the producers operating at a rate of 71.14 percent and ready to meet in the first quarter of 1960 a further increased quota equivalent to 91.4 percent of production in the 12-month period preceding control. The turn of the year, too, brought nearer the forthcoming United Nations' Conference on Tin when the draft of a new International Tin Agreement will be considered. The big question is whether conditions will exist to enable the United Nations to endorse the continuation of an instrument for the restriction of output when the current Agreement expires at the end of its five-year term on June 30, 1961.

The Agreement has proved its worth as a means to stabilize conditions for the benefit of both tin producers and consumers—it is virtually the only international commodity agreement to have succeeded—and the hardships and sacrifices suffered by Malaya's tin mining industry have not been in vain.

Increasing interest is being shown in Malaya in the use of hydrocyclones and jigs, as demonstrated by the Department of Mines Research Division, to replace older methods of recovering ore and the increasing use of this technique is likely to bring about a change in the mining landscapes, for the long-used wooden palong will undoubtedly be largely supplanted by it.

A record-breaking total of 3,760,684 long tons of iron ore was produced in 1959. The previous record was set in 1957 when 2,972,359 long tons were mined. Trengganu continued to be the Federation's premier iron-ore state by producing 2,116,200, over 56 percent of the country's total production for the year.

Although the Eastern Mining and Metals mine at Dungun probably reached the peak of its output, Trengganu will continue as the premier iron ore state until the Ulu Rompin mine in Pahang, owned by the Rompin Mining Company, a subsidiary of EMMCO, is in full production. Present plans are for an output of 1,000,000 long tons in 1962 and thereafter, 2,000,000 long tons annually.

The other four iron ore states increased production during 1959: Perak 615,238 long tons against 285,818 in 1958; Kedah 168,080—61,060; Kelantan 402,751—293,717, and Johore 458,415—446,340.

The notable surge in output in 1959 is likely to be continued in 1960 as Japan, Malaya's sole market for iron ore, has indicated that its steel industry intends to raise its imports of ore to 4,150,000 long tons by 1962.

Production of Metals and Minerals in Long Tons in Malaya in 1956, 1957, 1958, and 1959

Commodity	1956	1957	1958	1959
Tin	62,294	59,293	38,458	37,525
Coal	182,479	152,711	66,452	75,634
Iron ore	2,444,570	2,972,359	2,795,261	3,760,684
Ilmenite	122,276	91,734	74,827	72,851
Monazite	361	490	428	236
Tungsten	91	50	44	20
Columbite	276	142	159	120
Bauxite	264,444	325,629	262,354	381,747
Gold ¹	20,252	11,157	22,484	26,739
China Clay	1,155	1,510	1,200	1,282

1. Troy ounces.

Asia

The production of 26,739 Troy ounces of gold in 1959 was the highest for any year since 1940, when an all-time record of 40,283 Troy ounces was established.

China clay production showed a small increase over the 1958 figure, but production was down for ilmenite, monazite, tungsten, and columbite.

Jordan

A new Arab potash company was formed to produce 70,000 tons of potash salts, 5,000 tons of bromine, and 12,000 tons of sodium chloride annually. At year's end the Arab states had purchased shares valued at \$2,802,800 out of a registered capital of \$12,600,000. The remaining shares are to be sold to citizens of the Arab states. Production on a commercial scale is scheduled to start in 1961.

The Jordan Phosphate Mines Company, in which the government of Jordan holds a large share, invested \$2,800,000 in plants and operations. Production was increased to about 340,000 tons compared with 300,000 in 1958 and only 24,000 in 1952. With proven reserves of 40,000,000 tons and possible reserves as high as 150,000,000 tons, an increase in annual production to 1,000,000 tons is foreseen by 1962.

Jordan phosphate is marketed in central and eastern Europe as well as in Asia.

Study of the proposed superphosphate plant to supply the Arab world with some exports to other Asian countries was completed. Either local gypsum or imported sulphur will be used to manufacture sulphuric acid for use with the locally mined ore to produce the superphosphate fertilizer.

Pakistan

The mining year 1959 was characterized by a general upward trend in the extraction of minerals.

The increase in aragonite mining was due to the installation of a medium size marble cutting plant in Karachi. Bauxite is mainly used for the production of aluminum sulphate and as the demand goes up, so does the output of this mineral.

Chromite showed a sharp downward trend due to a particularly heavy rainy season which flooded all the mining areas and paralyzed for months the mining operations.

Mining of galena in the Chagai district was started on an experimental scale.

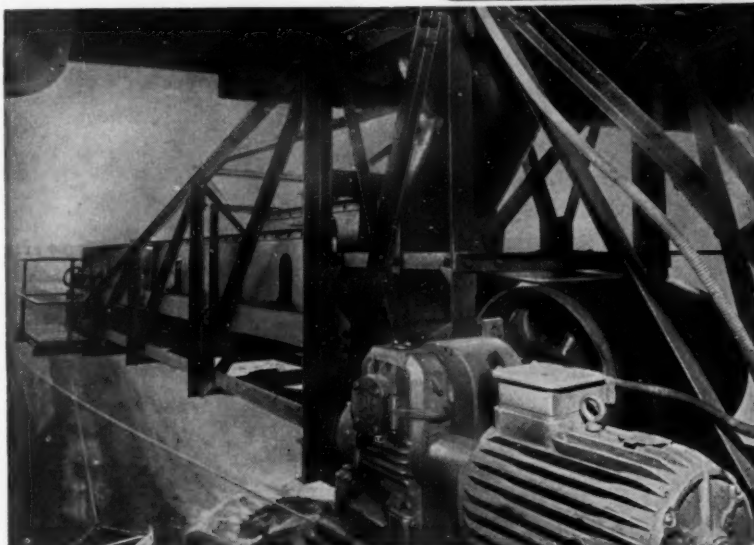
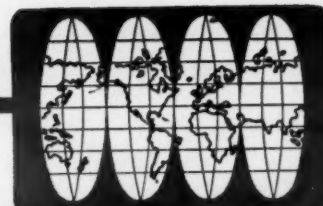
The substantial increase in production of stibnite was due to the commissioning by Pakistan Industries Ltd. of a plant for the production of antimony metal. The ore is transformed at the mine to antimony trioxide which was shipped to Karachi for reduction to antimony metal.

Thailand

Under the International Tin Agreement, Thailand was given a total export quota of 8,430 tons in 1959. This figure is only 62 per cent of the 1957 unrestricted production. Most tin dredges continued to work on reduced operating schedules. The gravel-pump mines were operated throughout the year.

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Asia

The new sea dredge of Tongkah Harbour Tin Dredging Ltd., was towed to Bhuket before the end of 1959. This Diesel dredge, equipped with 15 cubic-foot buckets for a maximum digging depth of 100 feet, was the largest dredge in the country.

Siamese Tin Syndicate Ltd., sold its Peak Dredge to Hock Chong Seng, a local Chinese firm.

Production of Minerals and Metals in Thailand From 1954 Though 1959

Commodity	1955	1956	1957	1958	1959
Tin ¹	11,023	12,481	13,531	7,726	9,528
Tungsten ²	1,127	1,162	893	592	456
Antimony ³	49	74	3	—	19
Lead ⁴	12,512	9,434	7,142	2,340	3,300
Manganese ⁵	—	408	346	1,000	410
Gypsum ⁶	—	—	2,100	5,700	3,500
Iron Ore ¹	5,000	5,775	8,975	14,750	6,074

1. Long tons metallic tin. 2. Long tons Concentrate. 3. Metric tons concentrate. 4. Metric tons.

With financial and technical assistance from the United States, the development of Mae Moh lignite mine and the construction of the thermal power station continued.

Turkey

Most significant developments in Turkey in 1959 were the commencement of an aerial mineral survey and the announcement of plans to erect a second steel making center. Mineral production remained at 1958 levels, except for chromite which dropped considerably.

Canadian Aero Services, Ltd., commenced the long planned aerial mineral survey early in 1960 for the Mineral Research and Exploration Institute, (MTA), Turkish government mineral agency. The survey will cover 124,500 square kilometers, utilizing magnetometer and scintillometer. The survey is being financed under a \$900,000 loan agreement with the United States Development Loan Fund. The survey will be completed in 15 months.

Results of the survey are eagerly awaited in Turkey in view of the announced intention to erect a second steel making center at Ereğli on the Black Sea coast. MTA concentrated its 1959 ex-

ploration efforts on iron ore deposits and will continue giving iron ore exploration priority attention in an effort to prove sufficient ore reserves to justify the construction of the mill. Basis for the decision to erect the mill was a favorable report by the Koppers Corporation on its economic feasibility.

First steps were taken in early 1960 to set up the company to operate the mill. Majority rights are to be held by Turkish and United States private interests. The new company intends to apply to the U. S. Development Loan Fund, Export-Import Bank, and international sources of financing for foreign exchange loans to finance imported equipment for the mill. Total cost is estimated at over \$250,000,000.

Iron ore production in 1959 dropped slightly from 950,888 tons in 1958 to about 910,000 tons. Major producer was the state-owned Divrigi mine, which produced 468,457 tons for the Karabük mill. Largest private producer was the Buyuk Egmir mine near the Aegean coast with an estimated output of 230,000 tons. Iron exports were 133,368 tons, all from private firms. Balance of private production was sold to Karabük.

MTA is reported to have proven 20,000,000 tons of additional iron ore in the privately controlled Hekimhan mine near Malatya, which may be a principal source of ore for the Ereğli mill. An adjacent deposit is to be explored during 1960. Exploration will also be carried out during 1960 at the Ozkoyuncu mine near Kayseri and the Kessikoprü mine near Ankara.

The Turkish chrome mining industry continued to be depressed during 1959 with production falling from 551,578 tons in 1958 to an estimated 360,000 in 1959, due largely to shutdown of many small private mines in late 1958 and early 1959. Exports fell from 516,004 tons in 1958 to 305,881 in 1959. Prior to May 6, 1959, chrome miners only received a premium of TL 4.9 instead of TL 9.0 for \$1.00 paid most other exporters following the start of the stabilization program in August, 1958. This made many operations uneconomical, but with the increase to the full premium in May, 1959, Turkey's competitive position improved and production and exports may be expected to improve in 1960. Port stocks at the end of 1959 were 168,000 tons.

Blister copper output increased to 25,037 tons in 1959, due to the state-owned Murgul mine increasing its output from 4,410 in 1958 to over 8,000 in 1959. All production comes from Etibank's Murgul and Ergani mines. The latter has received a \$1,500,000 credit from the Export-Import Bank to develop new production facilities to maintain present output. Present ore reserves are 12,000,000 tons of 2.64 percent Cu, considerably lower than the nearly exhausted high grade ore running over 7.0 percent from which production has been coming.

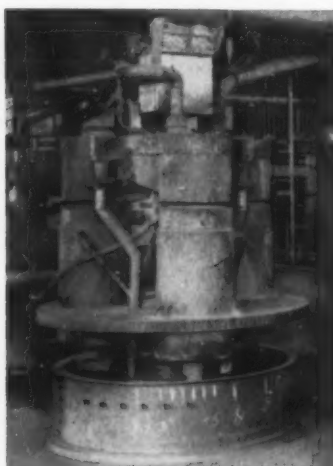
Consideration is being given by Etibank, as well as private producers, to establishing a boron refinery in Turkey for local consumption and export to Europe. Etibank is developing its 7,000,000 ton Emet boracite deposit and produced 6,916 tons in 1959. Total production was on the order of 70,000 tons, equal to 1958 output. Exports in 1959 were 70,671 tons.

Manganese production improved from 22,607 tons in 1958 to 31,500 in 1959, but is still considerably below prior years production. Restricted markets have held production down.

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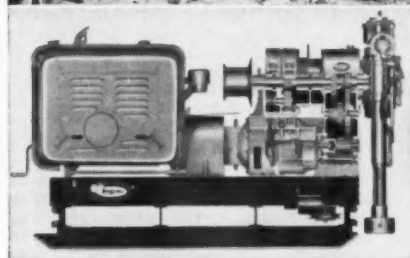
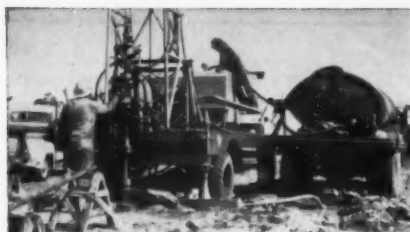
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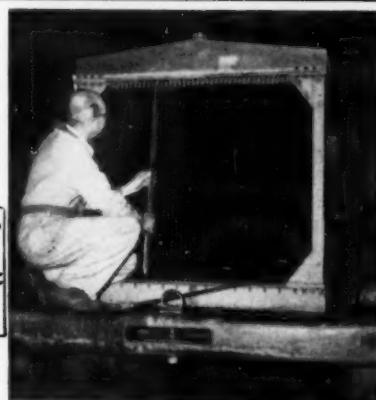


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Australia

In 1959, Australia's "vision splendid," development of the tropical north, appeared certain of fulfillment. In particular, Queensland's two mighty mineral deposits at Mount Isa and Weipa received widespread publicity and attracted international interest. A green light from the federal government to proceed with modernization of the Mount Isa-Townsville railway, long debated by politicians and their mere electors, was a tangible symbol, readily interpreted by the layman, whose conception of the scale and worth of mineral fields is rather nebulous until translated into everyday, material factors.

Although, in general, tonnage and value of the Commonwealth's metal production did not reach the record levels of some recent years, mineral exports from Australia are now second only in importance to wool.

Queensland

News from this State dominated the Australian mining world throughout 1959. Mount Isa Mines Ltd., Mount Isa, pressed on with its expansion program, passing the 8,000-ton-per-day target during October. About 70 percent of this is copper ore. A federal government decision to assist in financing modernization of the railway line to Townsville encouraged the company to expand its activities towards a target of 14,400 tons per day. The subsidiary company, Copper Refineries Pty. Ltd., opened its 30,000-ton refinery at Townsville during October and plans are already in hand for doubling capacity to co-ordinate with expansion of the smelter located at the mine. 72,000 tons of concentrates will be shipped to Japan in 1960 while these programs are under way.

Development of Commonwealth Aluminium Corporation Ltd.'s Cape York bauxite deposits continued while there was intense activity in seeking the best location for a treatment plant. Sites in Papua, Queensland, and New Zealand were under consideration (see also New Zealand report). It is likely that more than one plant will, eventually, be based on bauxite from this area. Comalco's Weipa deposits are believed to hold 1,000,000,000 tons of economic grade bauxite while Northern Australia, as a whole, is considered to contain 3,000,000,000 tons: approximately one-third of the world's reserves.

Australian Mine Production of Metals and Minerals from 1955 Through 1959¹

Mineral	1955	1956	1957	1958	1959
Gold ²	1,049,000	1,030,000	1,084,000	1,100,000	1,070,000
Silver ²	14,535,000	14,586,000	15,719,000	16,270,000	14,800,000
Copper ²	46,192,000	53,737,000	57,175,000	72,568,000	91,000,000
Lead ²	295,944,000	299,485,000	333,264,000	327,368,000	315,000,000
Zinc ²	256,564,000	278,082,000	291,582,000	263,044,000	250,000,000
Tungsten (WO ₃ content) ²	1,482,000	1,582,000	1,409,000	850,000	650,000
Tin ²	2,017,000	2,078,000	1,952,000	2,237,000	2,350,000
Rutile concls., (TiO ₂ content) ²	57,232,000	93,242,000	124,863,000	80,953,000	82,000,000
Ilmenite, (TiO ₂ content) ²	262,000	2,260,000	38,888,000	38,391,000	50,000,000
Zircon concls., (Zircon content) ²	48,209,000	71,769,000	87,703,000	58,747,000	96,000,000
Iron ore ²	3,572,609,000	3,923,985,000	3,805,473,000	3,925,524,000	4,030,000,000
Sulphur ^{2,4}		339,013,000	373,378,000	358,755,000	345,000,000
Metallurgical manganese ore (Manganese content) ²	20,462,000	25,856,000	34,904,000	25,623,000	33,000,000

1. Estimated. 2. Fine Ounces. 3. Long tons. 4. Recoverable content—lead, zinc, and pyrite concentrates.

Mary Kathleen Uranium Ltd., Mary Kathleen, added further color to the Queensland mining picture with an announced profit of £Au3,723,886 for its financial year. Production of oxide was 1,452,000 pounds. With its long term contract, the company is in a good position to weather storms in the doubtful years ahead.

New South Wales

There was considerable expansion in metal smelting, refining, and fabrication industries but the mining picture was not very different from that of 1958. Broken Hill Proprietary Co. Ltd.'s Port Kembla steelworks continued its rapid growth and will require increasing tonnages of iron ore from South and Western Australia. Relatively minor quantities continue to be imported from New Caledonia (less than 300,000 tons per year).

Rutile producers remain in the doldrums although their production and sales of zircon improved for a time during the first half of the year. Surprisingly, a large new producer entered the lists. Known as Wyong Minerals Ltd., it commenced operating near Wyong on the central coast after sponsorship by Commonwealth Mining Investments Ltd.

Broken Hill silver-lead-zinc mines collectively produced slightly less metal than in 1958. Assessment of Cobar copper-gold ore bodies by Broken Hill South Ltd.'s subsidiary, Cobar Mines Pty. Ltd., continued without any apparent degree of urgency. "South" also took preliminary steps towards investigation of its areas outside the present productive zone at Broken Hill.

Victoria

Metal mining and exploration continued to be on a very limited scale. No announcements of major importance were made.

Tasmania

Considerable exploration activity continued, principally in the northwest and southwest of the island, without any new productive undertaking appearing imminent. Major interested companies are The Mount Lyell Mining and Railway Co. Ltd., Queenstown; The Electrolytic Zinc Co. of Australasia Ltd., Risdon; and the Rio Tinto organization, which is headquartered in Melbourne, Victoria. The Commonwealth Bureau of Mineral Resources and the Tasmanian Mines De-

partment cooperated in the various exploration programs.

At Risdon, the E.Z. Co.'s refinery continued at record production levels; approaching 120,000 tons per year. At Queenstown, Mount Lyell was milling over 500,000 tons of ore per quarter at year's end and may produce 11,000 tons of copper, in 1960, for the first time in many years. Development of the Renison tin ore bodies under Mount Lyell's stewardship is proceeding with some very favorable ore discoveries reported.

King Island Scheelite, Grassy, King Island, resumed limited production.

South Australia

Evaluation of iron ore deposits, particularly on Eyre Peninsula, was stepped up during the year. The Broken Hill Proprietary Co. Ltd., the State Mines Department, and the Bureau of Mineral Resources were all concerned in this work. There is no doubt that this area alone, quite apart from important deposits at Yampi Sound and other locations in Western Australia, the Savage River, in Tasmania, and reportedly major discoveries at Constance Range, in Queensland, is quite capable of sustaining any foreseeable expansion of Australia's steel industry for generations ahead. About 85 percent of Australia's iron ore output at present originates in the Whyalla area.

Lead smelting activity at Port Pirie varied little from the previous year (189,000 tons) while uranium oxide output from the Mines Department plant, also at Port Pirie, was virtually unchanged.

Western Australia

Gold production declined slightly but the principal producers continued to operate profitably. Great Western Consolidated N.L., Western Mining Corporation's large, low grade producer suspended shaft sinking.

Deep drilling for a repetition of Kalgoolie's Golden Mile was resumed by Kalgoolie Southern Gold Mines N.L. with equipment designed to reach depths not previously examined during Australian gold exploration.

The state government made strenuous efforts to have the federal government's iron ore export ban removed. It is expected that limited export licenses will be granted during 1960. The ban is completely inconsistent with Federal policy on copper, all forms of which may be readily sent out of the country. There are far greater reserves of iron ore in Australia than of copper.

Northern Territory

Two companies began uranium production in the South Alligator River area. United Uranium N.L. has a mill at Moline to treat ore from El Sherana and other ore bodies 30 miles to the east. Output will be about 150 tons of oxide per year. South Alligator Uranium N.L. has a small plant near its mine at Rock-hole Creek and will produce 50 tons per year. The Rum Jungle plant continues to treat stockpiled ore in fulfillment of contracts but did not discover further uranium deposits. However, lead, and copper ore bodies have been located nearby and are expected to be of economic significance.

Peko Mines N.L., Tennant Creek, produced 25,000 tons of concentrate most of which was smelted at Port Kembla, New South Wales. Peko's Orlando prospect, west of Tennant Creek, was the source of much speculation but no positive ore reserve has been proven to date. Drill hole results were encouraging so that a new gold mine may be established.

British Borneo

The value of mineral production and exports from the British territories of Sarawak, North Borneo, and the State of Brunei, which together occupy about 80,000 square miles in the north and northwest part of the island of Borneo, continued to increase during 1959, and prospecting again produced encouraging results. This prospecting was based firmly on mapping by the government Geological Survey Department, which worked in cordial cooperation with the local companies of the Royal Dutch Shell group. The publication of regional geological maps, the first stage in the systematic appraisal of the mineral potentialities of the region, neared completion after 10 years of government surveying and compilation. Attention was steadily turned to detailed mapping of areas which have been found to show economic possibilities.

MINERAL materials exported during 1959 were valued at Ms354,907,015 (about £41,400,000), an increase of more than Ms5 million over 1958. Other mineral materials produced and used locally were worth a further Ms5,604,398. The total revenue accruing to the governments from the mineral industries was Ms101,362,282, a substantial contribution to the raising of living standards and administrative financial stability in the area.

Bauxite exports from Sarawak more than doubled during the year to 202,925 long tons, valued at Ms3,842,537, on which royalty and export duty of Ms320,388 were paid. This is a creditable performance for only the second year of mining, and is already making a greater contribution to the economy of Sarawak than the falling oil production from the Miri field. Discovery of the ore was a direct result of Geological Survey investigations.

Gold production trebled during 1959 and was the highest since before World War II. The increase is to be largely attributed to government encouragement by waiving royalty and permitting the local sale of gold, which alone has accounted for a 20 percent improvement in price.

Chromite prospecting in the Labuk Valley in North Borneo resulted in the discovery of several veins of high-grade ore that were considered to be worth further investigation.

Copper prospecting by geochemical methods, under the auspices of the Geological Survey, revealed one additional deposit and provided new information about the largest one that was already known; several applications for prospecting licences for copper were under consideration at year's end.

Asbestos, of short-fibre chrysotile type, was found in an area of brecciated ultrabasic rocks on Malawali Island, off the north coast of North Borneo, and is being further investigated. **Antimony** and mer-

cury ore deposits in Sarawak were examined under six general prospecting licences.

Mineral Production in Sarawak, British Borneo in 1958 and 1959

Mineral	1958	Value Malayan Dollars	1959	Value Malayan Dollars
Bauxite ¹	99,930	1,836,821	202,925	3,842,537
Gold ²	964	86,700	2,450	298,924
Phosphate ¹	306	25,600	619	67,606

1. Long tons. 2. Fine ounces.

Fiji

Mining was quiet during 1959, the only significant production being gold-silver, and manganese on a scale similar to the previous year.

Gold-silver output was entirely from the Vatukoula field where 172,395 long tons were treated to recover 72,566 fine ounces of gold and 23,652 ounces of silver.

Manganese mining was affected by world prices and no market was found for metallurgical grade ore. Production of high grade ore, 52 percent manganese and better, amounted to 19,191 tons from small deposits the largest of which are in southwest Viti Levu.

High grade magnetite amounting to 8,307 tons was produced in the Momi area, also on the western side of Viti Levu. This ore came from residual surface boulders and their occurrence is limited, offering no great possibility of large scale mining.

Copper mining was limited to a production of 99 tons of outcrop ore but considerable testing was under way by Japanese interests in the northeastern half of Vanua Levu. The trace of radioactivity originally reported in this ore has been proved to be of no value.

No commercial finds of bauxite were reported from the work done throughout the group by Canadian interests during 1958 and 1959.

Apart from copper, the future of which remains to be determined, the main prospect is still for the Vatukoula gold-silver deposit. No limits have yet been found for this occurrence which consists of sulpho-tellurides in an extensive system of flatly dipping fissures in basalts.

The sole operator, Emperor Gold Mining Company Limited, started erecting a new scrubbing, crushing, grinding, and classification unit to handle the troublesome propylitised ore at a rate in excess of 200,000 tons per annum. This plant should be in operation before mid-1960.

Gold Ore Mined and Milled in Long Tons, Ounces of Gold and Silver Recovered, and Long Tons of Manganese Mined in Fiji in 1957, 1958, and 1959

Item	1957	1958	1959
Gold-Silver			
Mined, tons	181,334	189,780	172,395
Milled, tons	208,507	191,737	172,395
Gold, fine ounces	78,807	81,827	72,566
Silver, fine ounces	25,278	17,670	23,652
Manganese			
High-grade, 48-60% Mn	20,698	20,046	19,191

Indonesia

Production of tin in Indonesia continued its decline mainly because of International Tin quotas, totalling in 1959 only 21,616 long tons, compared with the country's peak production of 54,000 in 1941. Although maintenance problems and lack of trained technical people might still prevent filling higher quotas, reserves are adequate, new exploration techniques are meeting with success, and deeper dredging methods may increase reserves considerably.

Tin output from Bangka was 11,451 long tons in 1959 as compared with 16,221 in 1958 and 17,292 in 1957. For mines at Billiton and Singkep, the 1959 total was 7,165 long tons, while in 1958 it was 6,980 and in 1957, 10,431. The country's total tin production in 1958 was 23,201 tons, and in 1957, 27,723.

Bauxite production, which has not been of much importance, can probably be expanded beyond present operations on Billiton and Bintan islands, since there are other likely areas. Development of nickel deposits in the Celebes has been hampered by political unrest in that area.

Lack of active prospecting in Indonesia for over 20 years is a factor in the country's low mineral development. Though there is high interest in mining, there is not enough encouragement by the government for either foreign and domestic interests.

New Caledonia

Production of nickel both for export and for on-the-spot processing into mattes and ferronickel increased in 1959 because of additional electric power output from the Yate Dam. New furnaces also contributed to the increase in metallurgical products. In 1958 ore production was only 600,000 tons, as compared with 1,800,000 tons in 1957. Production reached 1,400,000 tons in 1959 and the outlook for 1960 is for a continued increase.

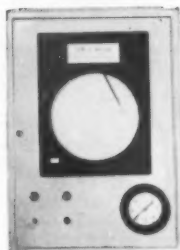
Nickel recovered from the Noumea plant totalled over 11,800 tons. The Societe de Nickel reports completion of an expansion program that should make its New Caledonia output reach 18,000 tons in 1960.

Treatment of cobalt ore yielded 4,000 tons of cobalt concentrate. Other 1959 figures include 290,000 tons of iron ore (55 percent); 3,000 tons of goiobertite (MgFeCO₃), and 44,000 tons of chrome ore containing 50 to 53 percent Cr₂O₃. Chrome production is about equal to demand.

New Guinea

Metal mining and mineral prospecting during 1959 continued at a low ebb while prospects for 1960 are not encouraging. There are no special incentives for Australian companies to invest in this territory, especially since the results of recent years suggest that mainland prospects are by no means exhausted. Gold was again the only economic metal produced for export, total production being nearly 48,000 ounces with 36,000 ounces of associated silver. The Morobe field, containing the Wau

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Oceania

and Bulolo deposits, was the principal producing area. Output for 1960 is estimated to parallel that for 1959.

Drilling and development at Amoura, Eastern Highlands, delineated a low grade gold lode but results were not encouraging. Testing of previously worked areas on the Lakekamu district, 180 miles northwest of Port Moresby, will commence in 1960.

A small Australian company, Pacific Island Mines Ltd., plans to prospect gold and sulphide bodies on Misima Island. Some 20 years ago, payable gold was mined on Misima.

New Zealand

Activity in these green islands was greater than for many years past. Apart from continued development of power, including that from geothermal steam in the Wairakei area, great interest centered in the power potential of Lake Manapouri, South Island. According to an agreement between the government and Consolidated Zinc Pty. Ltd., of Australia, C.Z. must decide by mid-1961 whether it will proceed with the establishment of an aluminium extraction industry based upon Weipa (Queensland) bauxite. Should the company decide to proceed, it must, by 1971, build a power station to produce 100,000 KW. daily which, after 10 years, must be increased to 600,000 KW. (See also Queensland, in review of Australia.)

During 1959, work continued in the Paparoa uranium district. Geological, analytical, and prospecting work was under way in assessing the value of uranium-bearing deposits in the Hawk Crag breccia, Buller River and near the Fox River, south of the Buller.

Gold dredges of Gold Mines of New Zealand Ltd., Arahura and Kanieri (Tere-makau) enjoyed record productions. These may almost be considered a "final fling" as the Arahura property is approaching extinction while the Tere-makau leases have only about seven more years' life. Recent returns from each of these properties have been well over 2,000 ounces of bullion per month from 250,000 to 350,000 cubic yards of gravel. With costs about sixpence per yard, good profits were earned. South Pacific Mines Ltd. began testing tailings near Thames and sent concentrates to the Port Kembla (Australia) smelter.

An iron-rich, low-silica, bauxite deposit was discovered in the Auckland province of North Island. This may have been more exciting but for prospects that Australian bauxite will be treated in N.Z. but, if the domestic deposit proves suitable, it will not be surprising to see an arrangement made whereby some of this material will be sent to any plant which may become established.

Philippines

Philippine mineral production recovered during 1959 as demand in foreign markets increased following the recession of 1958. The recovery was characterized by copper regaining the top position in point of value as the country's number one mineral product. For the first time the Philippines reported production of molybdenum, although only in small quantity, as a by-product of copper mining.

In gold production, however, the Philippines sustained a small loss as most mines failed to increase output because of declining ore reserves. But, the value of production increased by 10 percent due to continued purchases of gold by holders of "blocked" peso accounts which supported the price at 150 pesos per ounce or the equivalent of \$75.00 in United States currency.

Copper constitutes the most important segment in Philippine mineral production, comprising more than 50 percent of total value. Total production in 1959 was reported at 49,521 metric tons of estimated metal content of ores and concentrates produced, compared with 47,030 tons in 1958. The value of production amounted to P61,159,123 as against the value of P49,923,691 in 1958.

There were five copper mines in operation, which account for most of the production as only a very insignificant amount is recovered from gold mining operations. One other mine may be placed in production about the end of 1960 if Surigao Consolidated, a gold mining company, succeeds in obtaining machinery and equipment necessary to erect a concentrating plant on its property on Mindanao Island.

Atlas Consolidated Mining and Development Corporation, which operates a 15,000-ton per day flotation mill at its Toledo mine on Cebu, treated 3,941,412 short tons of ore and recovered 21,382 metric tons of copper. This is compared with 18,827 tons from 3,509,894 tons in 1958.

Lepanto Consolidated Mining Company, the country's number two copper mine, showed only a small gain in production, but there was an increase of 20.8 percent in value. Total production amounted to 13,125 tons of copper metal valued at P16,683,344, compared with 13,053 tons with a value of P13,812,298 in 1958.

The Sipalay copper mine of Marinduque Iron Mines Agents, Inc., also produced slightly less in quantity but there was a gain of 20.5 percent in value of production. The mine produced a total of 8,199 metric tons of copper valued at P10,295,628, compared with 8,248 tons with a value of P8,540,551 in 1958. The Bagacay copper project, also owned by Marinduque, registered a drop of 23 percent in volume due to declining reserves of high grade shipping ore. The medium grade ore was treated at the company's 400-ton mill

Production of Metals and Ores in the Philippine Islands for the Years 1952, 1953, 1954, 1955, 1956, 1957, 1958, and 1959¹

Commodity	1952	1953	1954	1955	1956	1957	1958	1959 ²
Gold ³	469,408	480,625	416,052	419,112	406,163	379,982	422,833	402,615
Silver ³	693,751	572,046	502,069	N.A.	541,168	479,216	497,987	504,085
Chromite ³	—	—	—	—	—	—	—	—
Metallurgical	52,364	88,541	62,595	59,745	127,370	113,358	34,489	118,952
Refractory	491,150	468,549	388,590	535,262	581,685	612,158	381,821	534,535
Iron ore ³	1,170,153	1,217,864	1,424,898	1,432,712	1,440,232	1,346,363	1,098,732	1,230,193
Copper ³	13,264	12,715	14,349	17,461	26,963	40,382	47,030	49,521
Manganese ore ³	20,627	21,508	9,393	11,912	4,414	30,231	22,308	34,804
Lead ³	2,300	2,434	1,827	2,318	2,140	814	1,284	355
Zinc ³	1,596	747	—	—	950	302	—	5
Mercury ⁴	—	—	—	635	3,015	3,363	3,321	3,500
Molybdenum ³	—	—	—	—	—	—	—	44

1. From Philippine Bureau of Mines. 2. Fine ounces. 3. Metric tons. 4. Flasks (76 pounds).

which was placed in operation in May, 1959. Total production of the Bagacay mine amounted to 3,868 tons valued at P4,886,223, compared with 5,029 tons with a value of P5,296,322 in 1958.

Philex Mining Corporation, which operates a 2,000-ton mill at its Santo Tomas II copper project, in Mountain Province, northern Luzon, treated 558,416 short tons of copper ore and recovered 2,667 metric tons of estimated metal content of concentrates produced, with a total value of P3,415,536. The Philex mill started operation in July, 1958.

Chromite production, both of refractory and metallurgical grades, increased by 57.7 percent in quantity to a total of 653,487 metric tons, compared with 414,310 tons in 1958. Increase in production was due to the revival of demand in the United States and Japan, as well as in European countries where refractory chromite, including "fines", found active markets.

Refractory chromite production amounted to 534,535 metric tons valued at P21,664,456, compared with 381,821 tons valued at P15,352,595 in the previous year. All the production in both years came from the Masinloc mine of Consolidated Mines, Inc., in Zambales, operated by Benguet Consolidated, Inc., on a profit-sharing arrangement.

Metallurgical chromite registered a big increase of 245 percent in volume and a gain of 148 percent in value. Total output amounted to 118,952 tons with a value of P5,763,146 as against total production of 34,489 tons valued at P2,323,610 in 1958. There were only two mines in operation in 1959. Acoje Mining Company, alone, produced 116,960 metric tons valued at P5,676,906, showing gains from 30,930 tons in 1958. The other mine, Liberty Chromite Mining Corporation, shipped 1,992 tons compared with one shipment of 1,359 tons in 1958.

Iron ore production totalled 1,230,193 metric tons with a value of P22,232,986. Of this total, Philippine Iron Mines Inc., produced 1,006,399 tons valued at P17,599,484 in 1959; 938,134 tons valued at P16,457,279 in 1958.

Quicksilver production showed only a little improvement, the total being 3,500 flasks compared with the 1958 output of 3,321 flasks. There is still only one mine producing quicksilver in the Philippines.

For the Philippines' first production of molybdenum, the output of 44 metric tons (in concentrate) valued at P242,446 was recovered as a byproduct from the milling of copper at the Sipalay mine of Marin-duque Iron Mines Agents, Inc.

Gold output was reported as 402,615 ounces, a drop from the 422,833 ounces in 1958. There were 10 mines which reported gold production of which three were copper mines. Benguet Consolidated, Inc., milled a total of 1,217,736 short tons of ore with a total recovery of 234,374 ounces of gold, compared with 1,169,937 tons of ore with a recovery of 232,405 ounces in 1958. The production included the ore from the Acupan mine which was acquired from Balatoc, Inc., in May, 1958. With this production, Benguet Consolidated continues as one of the world's largest gold producing companies.

Itoyon-Suyoc Mines, Inc., produced 32,971 ounces from 249,849 tons of ore milled, compared with the previous production of 30,996 ounces recovered from 215,917 tons of ore. The 1959 total included output from the company's Suyoc mine which started production with a 300-ton mill in April, 1959.

Baguio Gold Mining Company de-

creased production to 27,082 ounces recovered from 142,291 tons of ore, compared with 29,732 ounces from 139,636 tons of ore milled in 1958.

Surigao Consolidated Mining Company failed to develop additional ore to feed its mill at capacity, and as a result, production dropped to 13,550 ounces of gold from 74,357 tons of ore, compared with 36,086 ounces recovered from 84,978 tons in 1958. The Surigao mine was shut down several times during the past four years as a result of "sulphide" fires in its underground workings. The mine is now almost depleted of high grade ore and development work did not disclose any new ore in sufficient quantity and grade to feed its mill.


Benguet Exploration, Inc., operating a 50-ton-a-day mill under the management

of Philex Mining Corporation, produced 5,264 ounces of gold from milling of 10,971 tons of ore, compared with 4,993 ounces recovered from 10,298 tons of ore milled in 1958.

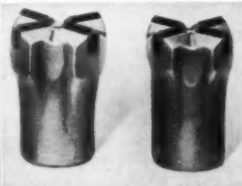
Three copper mines contributed to the gold output during 1959. Lepanto Consolidated Mining Company recovered 46,022 ounces of gold from treatment of 454,691 tons of copper ore, and ranks second in gold output in the Philippines. Atlas Consolidated produced 9,836 ounces of gold from disseminated copper ore, compared with 9,957 ounces of gold from 3,509,894 tons in 1958. Philex Mining Corporation, operating with a 2,000-ton mill throughout 1959, was able to recover 11,789 ounces of gold from 558,416 tons of low grade copper ore.

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NORTH AMERICA

Canada

Reflecting the marked improvement in demand for most of the principal mine products over the previous year, Canada's mineral production climbed to a record total value of \$2,389,683,300 in 1959, a gain of \$289,000,000 over 1958. Metals reached a value of \$1,359,032,000 in 1959, the fuels a value of \$540,106,000 and the non-metallic minerals, including the structural materials, a value of \$490,545,300, all three amounts being appreciably higher than the corresponding values for 1958. Uranium was first in metal value at \$324,549,600; then nickel at \$257,173,300; copper, \$233,296,400; iron ore at \$185,206,500; and gold at \$149,213,400, all being new records with the exception of gold.

Canada's uranium industry, which has been making remarkable headway during the past six years, has unfortunately reached a stage where the outlook for the next few years is not favorable. Owing to the large oversupply in the Free World in relation to the requirements, the United States Atomic Energy Commission decided that it would not exercise its options to purchase Canadian uranium after 1962. As a result of this decision, arrangements were made to allow companies to "stretch-out" the remaining undelivered uranium under contract until 1966, and at the same time permit the transfer of uranium sales contracts between Canadian producers. These developments will reduce the daily output from Canadian mines and also the number of producers.

The Canadian nickel industry had an excellent year with production an estimated 185,123 tons of nickel, a 33 percent increase over 1958 and 2,835 tons

under the all-time high reached in 1957. All Canadian companies operated at peak capacity, except that production from The International Nickel Company of Canada Limited was partially curtailed during January as an aftermath of a three-month strike in 1958. Contracts between the company and General Services Administration for the delivery of nickel to the United States government were cancelled by mutual agreement, with G.S.A. paying the company the difference between contract and market price in nickel oxide sinter from the Nicaro plant of Nickel Processing Corporation in Cuba. This additional nickel was required by INCO for the general market. Falconbridge Nickel Mines Limited at Sudbury, Ontario reached full production from its Fecunis mine and at year's end had a total mine production capacity of some 30,000 annual tons of nickel. Sherritt Gordon Mines Limited completed its mill expansion to 3,500 tons daily at Lynn Lake, Ontario. North Rankin Mines Limited in the Northwest Territories and Sherritt Gordon extended their refining agreement, with North Rankin agreeing to deliver up to 14,000 tons of nickel in concentrates over the next four years to the Sherritt Gordon refinery at Fort Saskatchewan, Alberta. Construction work at the INCO Thompson project in northern Manitoba progressed favorably. The annual capacity of the plant will be 37,500 tons of nickel from some 6,000 tons of ore per day. Refinery production should commence around the end of 1960 with capacity production the following year.

The Canadian copper industry, unlike most of the rest of the world, was not plagued with work stoppages, and output reached a record high of 394,893 tons, a rise of 49,779 tons over the previous year. Exploration for new properties and

development of already known deposits were stimulated by rising prices and the prospects of increased demand. Production from INCO mines at Sudbury, Ontario, Canada's largest producer was at a very high level. Hudson Bay Mining and Smelting Company Limited operated the Flin Flon, Birch Lake, and Schist Lake mines in Manitoba and Saskatchewan, and a concentrator and smelter at Flin Flon, Manitoba. The Noranda, Quebec smelter operated at capacity during the year, treating concentrates from Noranda Mines Limited's Horne mine and from most of the mines in eastern Canada, including Geco Mines Limited at Manitouwadge, Ontario; Quemont, Waite Amulet, and Normetal near Noranda, Quebec; and Campbell Chibougamau, Opemiska, and Merrill Island in the Chibougamau area of Quebec. In order to refine the anticipated increased output of anode and blister copper from the Murdochville, Noranda, and Flin Flon smelters, the Montreal East refinery of Canadian Copper Refiners Limited added four new tankhouse sections which will raise capacity from 20,000 tons to 21,200 tons per month by March 1960. This extension will mainly treat increased production from new mines in the Chibougamau area, notably Copper Rand.

A new record was set for iron ore production with 1959 shipments of 24,500,000 tons being 55 percent greater than 1958 shipments. Two main factors influenced the high level of Canadian production, namely the general high level of world activity and the unique developments arising out of the lengthy steel strikes in the United States steel industry. Canadian iron ore supplied Canadian steel plants normally supplied from the Lake Superior district of the United States. It also supplied those requirements arising out of a very high level of Canadian steel output. Canadian iron ore was used to supply that portion of the United States steel industry which continued to operate during the strike and to supply the expansion of stockpile facilities at United States ports.

Canadian production of lead remained practically constant, but mine production of zinc was 30,641 tons or about 7 percent lower at 394,458 tons compared with the 425,099 tons produced in 1958. British Columbia's mines produced about 60 percent of the combined output of Canada's lead and zinc. The principal producer was The Consolidated Mining and Smelting Company of Canada Limited which operated the Sullivan mine and 11,000-ton concentrator at Kimberley, the Bluebell mine and concentrator at Riondel, and the H.B. mine and concentrator near Salmo, plus lead and zinc refineries at Trail. Results of extensive exploration in the Mattagami Lake area of Quebec were encouraging. Indicated reserves of Mattagami Lake Mines Limited were increased from 20,000,000 to 22,000,000 tons.

The volume and value of asbestos shipments during 1959 were higher than in 1958. This improvement has come at a time when the industry is faced with difficult marketing conditions arising, in part, from increased competition in overseas markets from Russian fiber. Producers operated at less than full capacity because the total demand for fiber has not kept pace with asbestos capacity arising out of the construction of new productive facilities.

**Mineral Production of Canada, 1958 and 1959,
From Dominion Bureau of Statistics**

Metallics	1958		1959*	
	Quantity	Value Dollars	Quantity	Value Dollars
Antimony ²	858,633	\$ 284,208	1,614,000	\$ 516,126
Bismuth ²	412,792	771,267	415,909	883,296
Cadmium ²	1,756,050	2,669,195	2,059,731	2,636,456
Calcium ²	25,227	31,256	71,610	82,197
Cobalt ²	2,710,429	5,308,298	3,298,328	5,927,003
Copper ²	690,227,408	174,430,930	789,785,183	233,296,375
Gold ²	4,571,347	155,334,370	4,444,845	149,213,447
Iron ore ⁴	15,726,323	126,131,181	24,477,004	186,206,552
Lead ²	373,360,966	42,413,805	372,989,560	39,574,191
Magnesium ²	13,591,705	4,064,825	11,633,213	3,489,964
Molybdenum ²	888,264	1,152,838	850,000	1,105,000
Nickel ²	279,117,422	194,142,019	370,246,434	257,173,340
Palladium, iridium, etc. ³	154,366	4,840,072	170,160	5,662,499
Platinum ²	146,092	9,481,371	149,510	10,951,608
Selenium ²	306,990	2,302,426	564,415	3,849,905
Silver ²	31,163,476	37,053,007	32,329,137	28,381,750
Tellurium ²	38,250	65,025	96,954	208,401
Thorium ²	—	—	54,037	116,141
Tin ²	795,496	625,260	896,000	931,840
Titanium ore ⁴	—	—	24,000	126,000
Tungsten (WOs) ³	690,976	1,898,455	—	—
Uranium (UOs) ²	26,805,232	279,538,471	30,993,754	324,549,609
Zinc ²	850,197,572	92,501,496	788,916,041	96,563,324
Total		\$1,130,160,395		\$1,359,032,024

1. Preliminary. 2. Pounds. 3. Troy Ounces. 4. Tons.

**Cryolite, Lead, and Zinc Exports from Greenland, and Cryolite Concentrate
Exports from Denmark in Metric Tons from 1955 through 1959**

Year	Cryolite To Denmark	Cryolite To United States	Total	Cryolite Concentrate Exported From Denmark	Lead	Zinc
1955	33,512	8,299	41,791	18,230	6.0	0
1956	30,090	8,800 ²	38,890	19,232	3,663	4,837
1957	33,993	15,400 ²	49,293	21,985	8,461	12,896
1958	30,270	10,700 ²	40,970	20,986	9,586	8,644
1959	33,400 ¹	15,000 ²	48,400 ¹	21,662	0 ²	0 ²

1. Estimated. 2. All Production stockpiled.

North America

Canadian gold production continued to become a less important factor in the Canadian mineral economy. Value and volume dropped due to economic conditions, mainly increased labor costs and an increase in the value of the Canadian dollar vis-a-vis the United States dollar.

Greenland

Three mining companies operate to produce cryolite at Ivigtut in southwest Greenland by Kryolitselskabet Oeresund A/S; lead and zinc at Mesatersvig in east Greenland by A/S Nordisk Mineselskab; and coal at Qutligsat, Disko in west Greenland by Groenlandske Handel. This is the only cryolite mining operation in the world.

Cryolite (Na_3AlF_6) ore production has been on the order of 150,000 to 200,000 metric tons per year. However, it is estimated that the ore body will be depleted in two to three years. About 1,000,000 tons of ore should then be stockpiled. Company geologists have prospected for other cryolite deposits within 20 miles of the mine for many years without success. Prospecting will continue. Geologists from the State Geological Institute worked in southern Greenland to locate favorable areas for cryolite and other mineral deposits. Ships and helicopters were used.

About 400,000 tons of very fine grained material is known in the bottom of the mine. It does not appear likely that it will be mined, as concentration will be difficult and costly because it contains 50 percent fluor spar and 25 percent topaz.

The lead-zinc mine at Mestersvig will be depleted in about three years as known reserves in the mine and surrounding area have not been increased despite vigorous prospecting.

Molybdenite has been discovered and prospected on the east coast. While no announcement has been made as to grade it is believed to be too low for mining because of the adverse operating conditions—glaciers, rocks, and severe climate.

From 15,000 to 20,000 metric tons of coal are mined annually and burned in heating stoves in western Greenland. It is low grade, about 9,000 BTU's per pound. On a peninsula north of Disko-Nuqssuaq about 50,000,000 tons of coal has been estimated in seams one to three feet high. It has a BTU value of about 8,000 per pound. Total length of the beds along the south coast is about 20 miles. Coal crops out from sea level to a height of about 2,000 feet.

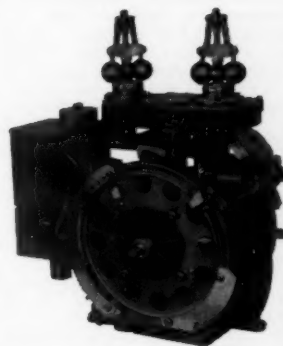
Geologists have worked in Greenland for more than 150 years. The entire ice-free coast line is mapped in detail and is geologically well known. Geological characteristics are easily recognized as there is no vegetation and little weathering of rocks. The deep fjords cut through the rocks exposing them beautifully for the geologist. Prospectors who come to Greenland for the first time believe that it is a virgin land geologically speaking. Many of them give up after learning what has been done to date. Nevertheless, the Danish geologists have their methods and continue to prospect with hopes of success. However, no major deposits are expected to be discovered as geological conditions are believed unfavorable.

The Danish government formed a committee in 1959 to prepare a mining law. This is expected to take about three years.

All companies interested in prospecting in Greenland must first contact the Danish government.

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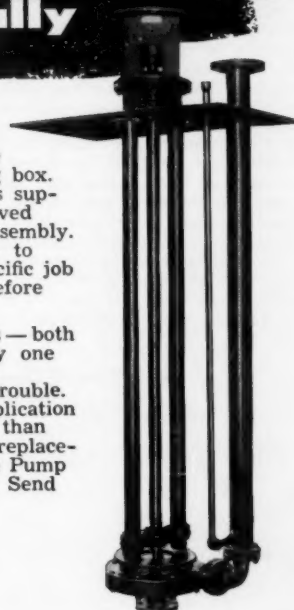
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LATIN AMERICA

Argentina

The Argentina government's mining policy resulted in a small decrease in activity. Depreciation of currency late in 1958 adversely affected imports of mining equipment in 1959. As part of the plan to promote free enterprise the government, which had been the only buyer of tungsten, stopped purchases in view of the decline in world prices so as not to continue over production. This forced closure of companies just getting into production. However, operating mines were paid a bonus to keep operating at reduced scale.

St. Joseph Lead Company's subsidiary —Cia Minera Aguilar S. A.—operated its lead-zinc mine and flotation mill in Jujuy Province as well as its zinc smelter at Comodoro Rivadavia throughout the year. National Lead Company S.A. operated its Castano Viejo lead-zinc mine and flotation mill, and continued exploration throughout the country.

Interest in iron ore continued at high level with the two new blast furnaces at Zapla furnishing a market for ore. Preliminary steps were made to bring the Sierra Grande iron deposits (86,000,000 tons of 55 percent iron) in Rio Negro Province into production. Output is scheduled for the San Nicholas blast furnace in Buenos Aires in 1963. Other production will be exported, probably by the Southern Cross Steel and Mining Company of New York, which was negotiating for a mining lease at year's end. An iron ore deposit was reported discovered at Valles Calchaquies, Salta Province.

An important copper deposit was discovered in San Juan Province by engineers of the International Basic Economic Corporation of the United States. This firm was prospecting the east side of the La Brea Sierra under contract to the provincial government when the discovery was made.

Uranium ore reserves were estimated at 300,000 tons with a grade of about 1.0 percent U_3O_8 . Twelve mines were in operation in San Luis, La Rioja, and Salta provinces. Three mills were in operation in Cordoba, Mendoza, and Buenos Aires. Exploration for uranium was active throughout the year with important discoveries reported from the Salta, Cordoba, and La Rioja provinces.

A modern boron plant was built to process ore from the large deposit near Campo Quijano, Salta Province.

Production of vanadium was started at the La Nelly mine in San Luis Province. While the ore averages two to three meters in thickness and assays 0.82 percent V_2O_5 an economic operation is predicted on an 85 percent mill recovery and low mining cost.

Underground development of the Farellon Negro gold-manganese deposit continued in Catamarca Province. Metallurgical tests were made on the ore. Government and private geologists made interesting discoveries of manganese in Santiago de Estero, Misiones, and Mendoza provinces.

Bolivia

Mineral production during the year showed some improvement over 1958. Exports of tin, antimony, tungsten, bismuth, and gold were up, while exports of lead, zinc, copper, and silver were down, following the world trend. Overall value of mineral exports in 1959 increased 23.6 percent to \$66,296,557. However, much of this was due to a barter deal of excess tin stocks sold to the United States stockpile. Production at many of the mines declined and/or operated at a substantial loss due to strikes, absenteeism among workers, shortage of supplies and equipment, and lack of technical help.

South American Placers, Inc., wholly owned subsidiary of South American Gold & Platinum Company, started gold dredging operations in November in the Kaka-Beni area in eastern Bolivia. Reserves are estimated to be 28,168,000 cubic yards of gravel with an estimated recoverable content of 55¢ per cubic yard. The company continued exploration and study of other promising areas that may warrant bringing in a second dredge.

The Nitto Metal Mining Company and Dowa Mining Company of Japan began a joint venture to operate the Chacarilla copper mine near the Bolivian-Chilean border on the La Paz-Arica railroad.

A West German Geological Mission began a survey of the mineral wealth of Bolivia. Members of the Mission will visit and examine all the mines under the control of the Corporacion Minera de Bolivia, Mineria Mediana, and the Banco Minero de Bolivia, as well as other mines and districts throughout the country.

The Pulacayo mine, once operated by the Cia. Huanchaca de Bolivia, was closed down by the Bolivian government during the year. Gold exploration work was abandoned in eastern Bolivia by the Bol-Inca Mining Corporation.

Brazil

The development of Brazilian mineral resources advanced on all fronts during 1959. The Mineracao Wah Chang, S. A., a subsidiary of the Wah Chang Corporation of New York, New York, and the Molybdenum Corporation of America, developed a very large tonnage of colum-

bium ore at Araxa in Mina Gerais. The deposit is a ring-shaped volcanic intrusive that has been so oxidized and weathered that mining will require no dynamite and milling will require no crushing. Mining will be by open pit and a 200-ton per day mill is planned to concentrate the ore to over 70 percent Cb_2O_3 . The concentrate will contain essentially no tantalum so that nuclear grade columbium metal can be made without expensive separation. The Araxa deposit is estimated to contain more than 15,000,000 pounds of columbium metal which makes it the largest deposit of columbium ore in the western hemisphere.

The M. A. Hanna Company of Cleveland, Ohio, together with Leo Model and associates from New York, continued exploration of the iron ore properties of their newly acquired St. John d'el Rey Mining Company, Minas Gerais. The Pignatari Industrial concern of Sao Paulo made plans during the year for development of copper resources in the states of Rio Grande do Sul Bahia. The Companhia Vale do Rio Doce is expanding iron ore exports 100 percent to 6,000,000 tons a year, and began construction on additional facilities at its open-pit mine on Caue Peak, Itabira.

The Jose Ernirio de Moraes group from Sao Paulo announced plans to build a zinc reduction plant in the state of Minas Gerais, and the Companhia Siderurgica Paulista of Sao Paulo awarded a \$170,000,000 contract to the heavy construction division of the Henry J. Kaiser Company for the construction of a steel plant at Piacaguera, Sao Paulo. The Companhia Siderurgica Mannesmann announced plans to double its steel production at Belo Horizonte, Minas Gerais, and to install equipment which will increase production of cold rolled plate.

Widespread exploration activities for mineral deposits were undertaken during the year by Brazilian, United States, Japanese, and French interests.

British Guiana

During 1959 the Demarara Bauxite Company produced 1,511,077 long tons and the Reynolds Metals Company produced 163,339 long tons of bauxite ore at their open-pit operations.

The dredges of the British Guiana Consolidated Goldfields were shut down this year due to rising costs and unofficial strikes. Thus gold production during the year was mined exclusively by small operators who were also responsible for the total output of alluvial diamonds. Significant diamond discoveries in the upper Kurupung River above Kumerau Falls the end of 1958, and at the Mazaruni River, attracted much attention and accounted for the spectacular increase in production.

The development of the manganese deposits near Arakaka and Pipiani by the Northwest Guiana Mining Company, a subsidiary of Union Carbide, continued during the year, and first production is scheduled for 1960. Ore will be shipped by railroad from the mine to Kaituma and thence down the Kaituma River to Trinidad by 3000-ton ore carriers. Production is expected to reach 10,000 tons a month by mid-1960.

Exploration continued on a reduced scale for radioactive minerals and columbite but no significant discoveries were made.

Metric Tons of Ores and Concentrates Exported From Bolivia in 1958 and 1959

Commodity	1958		1959	
	Ores & Conc.	Metal Contained	Ores & Conc.	Metal Contained
Tin	45,029	17,297	64,066	23,153
Lead	38,855	21,912	36,858	21,772
Zinc	25,319	14,222	6,809	3,393
Antimony	8,163	5,242	8,751	5,499
Copper	8,434	2,784	6,916	2,143
Tungsten	2,112	1,337	2,290	1,454
Bismuth	324	111	603	221
Silver	—	183	—	140
Gold ¹	—	19,179	—	35,364

1. Troy Ounces.

Chile

The mining industry in Chile broke records this year in the production of copper, iron ore, gold and silver. Development of new mines, construction of new facilities, and plans for expansion foretell continued progress for the industry through 1960.

Total copper production for the country was 545,999 metric tons, an increase of 78,788 tons over 1958. Anaconda's new El Salvador mine, close to Santiago, began operations and is expected to reach an annual output of 100,000 tons of blister copper, which will more than compensate for the loss of 40,000 tons production from the exhausted Potrerillos mine. Anaconda announced that it plans to build a new copper smelting and refining plant at Chanaral to refine El Salvador blister copper. The Braden mine of the Kennecott Copper Corporation mined and milled 11,052,428 net tons during the year in spite of a one-month strike in October. Plans are being made by Kennecott to increase production capacity of the Braden operations.

Development and construction continued at the Mantos Blancos copper mine near Antofagasta and operations are expected to begin by mid-1960. Cerro de Pasco Corporation continued exploration on its Rio Blanco copper property, east of Santiago, where drilling to date indicates 116,000,000 tons of 1.6 percent copper ore. Exploration on copper properties continued during the year in the Vallenar area, and near Putaendo in the Province of Aconcagua.

Copper Production In Metric Tons By Sources and Types In Chile in 1957 and 1958

Source	1957	1958	1959
Large Mining Companies			
Electrolytic	154,934	128,900	137,200
Refined	66,012	59,209	64,301
Blister	212,863	231,860	285,101
Sub Total	433,809	419,969	486,602
Small and Medium Mining Companies			
Electrolytic	0	90	—
Blister	15,820	20,631	20,266
Export minerals	4,233	2,248	3,067
Concentrates	24,277	20,699	31,522
Cement copper	3,409	3,456	—
Sub Total	47,720	47,124	54,855
Grand Total	481,528	467,093	541,457

A total of 4,345,805 metric tons of iron ore averaging approximately 64 percent iron content were produced by Chilean mines during the year. This is an increase of 707,825 metric tons over 1958. Most of this tonnage was exported by the leading companies: Compania Minera Santa Fe, Bethlehem Chile Iron Mines Company, Compania Minera Santa Barbara, and the Societe Minera Cerro Iman. Plans for expansion and new acquisitions by

Copper Production in Chile by the Anaconda Company and Kennecott Copper Corporation Mines in Pounds for 1956, 1957, 1958, and 1959

Mine	1956	1957	1958	1959
Anaconda (Chuquicamata)	532,008,343	540,195,146	427,136,000	556,000,000 ¹
Anaconda (Potrerillos)	86,330,173	87,437,221	65,870,000	35,000,000 ¹
Anaconda (El Salvador)	—	—	—	72,000,000 ¹
Kennecott (Braden)	347,826,000	339,024,483	344,856,000	364,034,000

1. Estimated.

C. M. Santa Fe, Bethlehem Chile Iron, and the Compania de Acero del Pacifico highlighted the year. Santa Fe and Bethlehem jointly plan the development of the El Lago deposit in the Province of Antofagasta at a cost of about \$300,000,000. More than 1,000,000,000 tons of ore are outlined in four large ore bodies within a three-mile radius. Iron content averages between 66 and 69 percent with low phosphorus. The Compania de Acero del Pacifico, the Chilean concern that operates the Huachipato steel mill, announced in December that it had purchased the Algarrobo iron deposit from the William P. Mueller concern of Amsterdam. This property in the Atacama-Coquimbo area reportedly contains up to 70,000,000 tons of plus 65 percent iron ore. Development has started and the mine is expected to be ready for production by 1961. Other news in the Chilean iron industry during 1959 includes the development of the Adrianitas iron mine near Copiapo by the Japanese Mitsubishi interests who expect to begin operations by mid-1960, and Bethlehem's intention to expand its operations in the Coquimbo area.

A titanium-zirconium beach sand deposit was discovered on the west coast of the island of Chiloe reportedly containing more than 200,000,000 cubic yards of potential ore material, and the Chilean government has undertaken the development of several uranium deposits in the central provinces.

Colombia

The mining industry in Colombia has been severely restricted in past years due to legal entanglements and government interference. To reverse this trend a government economic plan is now being formulated by a congressional committee which will aim to encourage development of the country's mineral resources.

The South American Gold & Platinum Company was the largest mining operator in the country in 1959. The dredges of its subsidiaries—Compania Minera Choco Pacifico S.A., and Compania Minera de Narino—operated throughout the year. The partially owned Pato Consolidated Gold Dredging Ltd. operated six dredges on the Neche River in Antioquia. Exploration by the company during the

early part of the year disclosed some interesting prospects.

Productos Industriales Minerales Ltda. mined and processed over 12,000 metric tons of barite in the Departments of Santander and Tolima. The Baroid Division of the National Lead Company is interested in barite concessions near Ocana, Department of Santander.

Important discoveries of antimony and magnesium have been reported from the Department of Cauca.

With the addition of a used rolling mill from Chile the capacity of rolled plate from the Paz del Rio steel plant will be increased substantially. The zinc smelter at Bogota, operated by Metales y Productos Afines, began producing on imported zinc ores but eventually hopes to secure domestic ores from Junin, 30 miles from Bogota.

Metal and Mineral Production In Metric Tons in Colombia in 1958 and 1959

Commodity	1958	1959
Sulphur	6,800	8,500 ¹
Barite	13,000	12,000
Kaolin	4,000	—
Coal	2,300,000	2,500,000
Coke	300,000	311,000
Lime stone	1,820,000	1,950,000
Cement	1,213,262	1,347,619
Feldspar	4,000	—
Iron	562,000	404,575
Mercury ²	15,428	—
Rock salt	219,090	214,311
Marine salt	70,832	52,048
Gypsum	60,000	—
Emeralds ³	88,445	55,000
Gold ⁴	271,715	395,924
Silver ⁵	105,162	102,678
Platinum ⁶	16,036	15,846

1. Estimated. 2. Pounds. 3. Metric carats. 4. Troy ounces. 5. Ten months.

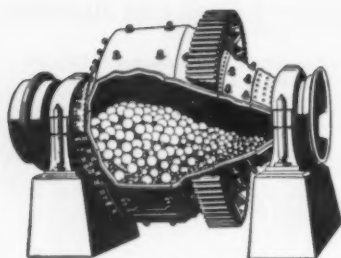
Dominican Republic

Mining highlight of 1959 in this Republic was the first shipment of bauxite ore by Alcoa Exploration Company. This subsidiary of Aluminum Company of America has a 50 year government lease on the Las Mercedes and Aceitillar deposits in Barahona Province. Extensive reserves of open pit ore assaying between 45 and 50 percent Al_2O_3 have been developed. Ore is mined and trucked to the port of Enriquillo for shipment to the United States. Mining, trucking, and ship

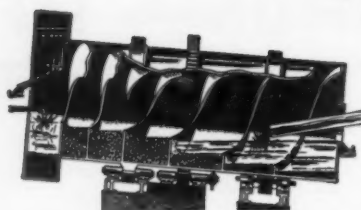
British Guiana Mineral Exports and Value in 1955, 1956, 1957, 1958 and 1959¹

Commodity	1955		1956		1957		1958		1959 ¹	
	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value
Bauxite										
Calined ²	252,330	£1,789,078	317,878	£2,322,163	287,130	£2,072,183	195,649	£1,792,352	224,655	£2,072,332
Dried ³	1,916,891	3,374,956	1,789,765	3,789,326	1,734,064	4,077,656	1,168,637	3,348,195	976,360	2,967,384
Diamonds ⁴	33,227	280,342	30,871	277,841	28,455	283,685	33,090	348,439	43,503	509,953
Gold ⁵	13,204	171,983	6,224	82,676	7,699	103,897	10,777	161,116	413	6,232
Total Value:		£5,616,359		£6,472,006		£6,537,421		£5,650,102		£5,555,901

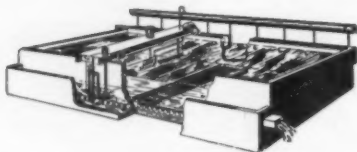
1. First 10 months. 2. Metric tons. 3. Metric carats. 4. Troy ounces.



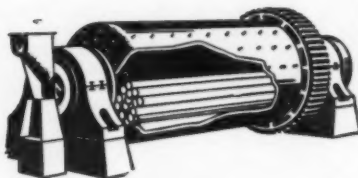
CONICAL MILLS



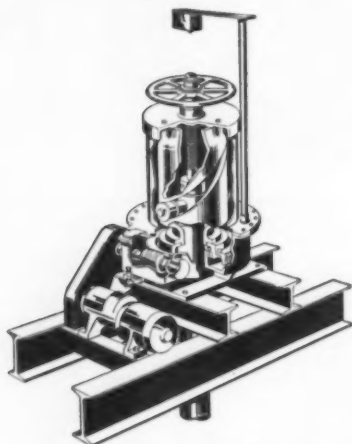
COUNTER-CURRENT CLASSIFIERS
HEAVY-MEDIA SEPARATORS



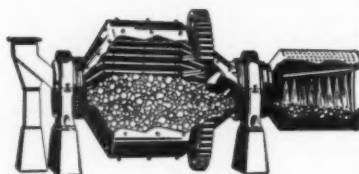
AUTOMATIC BACKWASH SAND
FILTERS



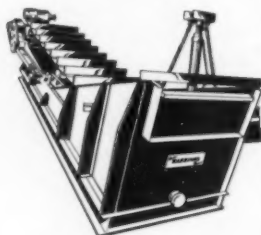
ROD MILLS



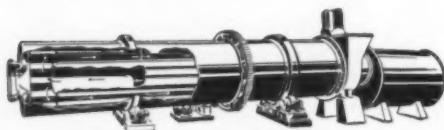
"AUTO-RAISE" THICKENER MECHANISMS



CONICAL ORE SCRUBBERS



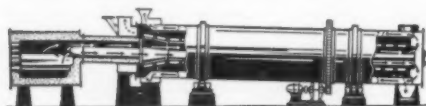
"OVERDRAIN" CLASSIFIERS



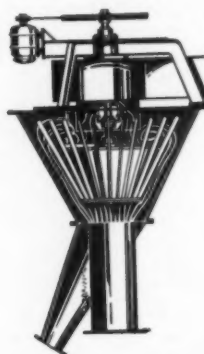
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loading facilities have been designed for an annual capacity of 1,000,000 tons.

Falconbridge Nickel Company of Canada and its subsidiary—Minera y Beneficiadora Falconbridge Dominicana C. por A.—prospected for nickel ore in the western area with reportedly satisfactory discoveries. Mining was under study. Ore is lateritic so company was developing metallurgical treatment methods.

Other mineral production, largely for export, was iron ore by Compania Minerales C. por A. in Sanchez Ramirez Province; and salt and gypsum by the firm, Sal y Yeso C. por A. in Barahona Province. A major expansion and mechanization program was completed at the firm's Las Salinas mine and Barahona port docks. Loading facilities operate at the rate of 1,000 tons per hour at the port.

Ecuador

Gold production for 1959 amounted to 18,160 fine ounces worth \$634,104 and silver production amounted to 109,165 fine ounces worth \$99,121. Nearly all of this production came from deposits in the Portovelo area.

A French technical mission began a geological survey and study of the mineral resources of Ecuador in 1959. During the year they mapped and surveyed some of the gold-silver properties of the Ayapampa district in the Portovelo area; were successful in prospecting for copper in the Fierro Urco area; studied the gold placers of the Santa Barbara River in the Province of Azuay and the Ayllon and Collay Rivers in the Sigsig and Gualaceo regions; determined the economic importance of the region of Pilzhum in the Province of Canar; made examinations along the West mountain range in Santa Isabel and Molleturo; and verified the existence of molybdenum at Balsapamba, Province of Bolivar.

The Natomas Company of San Francisco, California conducted some test drilling work on its gold placer concessions along the Zamora and Nangaritza Rivers in southeastern Ecuador.

Universal Mineral Resources reportedly acquired rights to black sand deposits along the coast and the Koppers Company of Pittsburgh, Pennsylvania, is to erect a 125-150 ton per day steel mill.

Mexico

Lead, zinc, and copper production dropped in 1959 due to export quotas and low prices. The increase in domestic consumption of these metals gave the Mexican mining industry a little relief. Mexico has long been the number one silver producer in the world, but even silver production was down from 1958 levels. This was mostly due to less production from Cia. Real del Monte y Pachuca, silver producer.

One of the major silver and gold producers in the State of Chihuahua, La Bufa, owned by Potosi Mining Company suspended operations in 1959 due to low grade ores.

Sulphur production hit a record high of 1,225,000 metric tons but it was not up to expectations. It is doubtful that the

Latin America

goal of 2,000,000 tons will be reached in 1960 as was first believed.

Two sulphur companies suspended operations in 1959. Cia. Azufre Mexicana sold its stock to Comision de Fomento Minero late in 1958. Cia. Exploradora del Ismo, S. A. a subsidiary of Texas Gulf Sulphur Company has also suspended operations. The reasons given were that there was not the amount of sulphur calculated and difficulties encountered in the application of the Frasch process because of the nature of the domes.

Cia. Azufres de Mexico, S. A., at one time connected with Freeport Sulphur Company and now associated with Sulphur Exploration Company is in its fifth and final year of exploration. They have drilled a total of 130 holes—some with very promising results. Azufre Pan Americana, S. A., a subsidiary of American Sulphur Company is the main producer with a monthly output of 70,000 tons. Cia. Azufres Veracruz, S. A. is producing 25,000 tons per month. Cia. Exploradora del Ismo was producing 8,000 tons per month before suspending operations.

Mine Production of Metals and Minerals in Metric Tons in Mexico

Commodity	1958	1959
Gold	11,096	11,012
Silver	1,716,015	1,495,500
Copper	77,066	74,450
Lead	238,167	174,900
Zinc	486,990	415,700
Iron	667,237	672,800
Manganese	98,194	100,230
Antimony	1,985	1,630
Mercury	1,225	825
Graphite	21,960	15,700
Tungsten	22	26
Arsenic	2,976	2,785
Sulphur	998,750	1,225,000

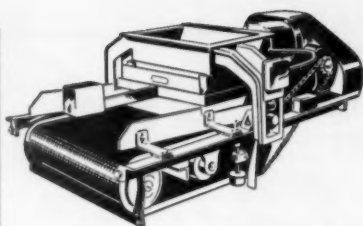
About 35 small lead, zinc, and copper mines closed in the early part of 1959. Most of these mines were able to reopen later in the year with help from Comision de Fomento Minero.

Manganese production continued to increase and is expected to keep increasing during 1960. Cia. Minera de Autlán, an affiliate of Bethlehem Steel Company, continued to be one of the country's leading producers. The same company has started preliminary work on a new discovery in Huacilla, State of Oaxaca.

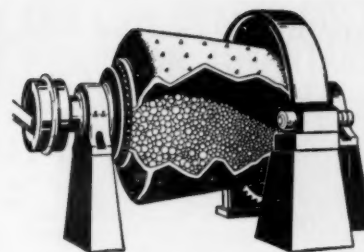
San Francisco Mines of Mexico at San Francisco del Oro, Chihuahua increased its ore reserves. Partially and fully blocked out ore as of September 30, 1959 amounted to 5,638,230 metric tons. San Francisco Mines milled 808,400 metric tons in 1959. The concentrates produced were: lead, 53,964 metric tons; zinc, 92,313, and copper, 8,178.

Ore reserves of The Fresnillo Company at its Fresnillo, Plateros, and Naica units were down slightly from 1958. The sulphide ore reserves as of June 30, 1959 were estimated at 5,771,639 metric tons. Fresnillo milled a total of 935,500 metric tons in 1959. The new Fortuna circular shaft started by the company at Fresnillo went very slowly during 1959 because of tremendous water pressures and volumes encountered.

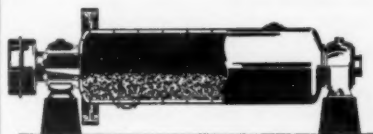
Altos Hornos de Mexico produced 360,000 tons of iron and steel in 1958 and more than 500,000 in 1959. The annual goal is to produce 1,000,000 tons by 1962. This would probably make the country self-sufficient in iron and steel. Iron ores reserves continued to increase and are estimated at near the 500,000,000



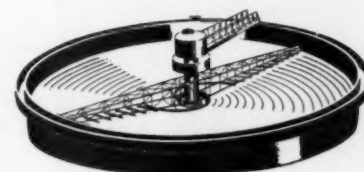
CONSTANT-WEIGHT FEEDERS ®



TRICONE MILLS



BALL AND PEBBLE TUBE MILLS



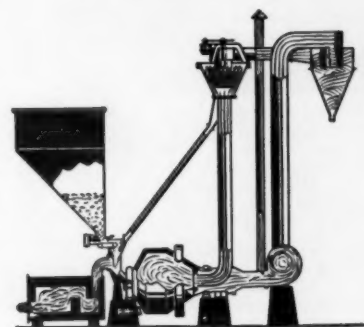
CENTER-PIER CLARIFIERS AND THICKENERS



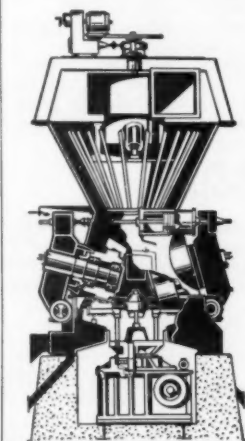
HYDRO-CLASSIFIERS



CASCADE MILLS



"GYROTOR" AIR CLASSIFYING SYSTEMS



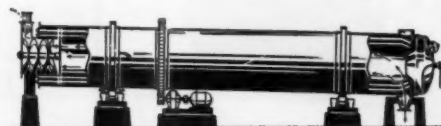
DISC-ROLL MILLS



SINGLE-SHELL ORE AND CONCENTRATE ROTARY DRYERS



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ton mark. The Board of Irreplaceable Natural Resources, however, has brought out the fact that a good percentage of these ores are close or over the permissible sulphur content for iron ores. A study is under way to classify them as to sulphur and phosphorous content.

Hojalata y Lamina, S. A. at Monterrey has proven that its HyL process for direct reduction of iron ores is a commercial success. The process was developed at Hojalata y Lamina in conjunction with M. W. Kellogg Company's engineers.

Peru

The Toquepala project of the Southern Peru Copper Corporation was completed during the year with a total investment of \$237,113,000. Of this large sum \$119,597,000 was borrowed from the Export-Import Bank, \$10,116,000 from suppliers of equipment, and \$107,400,000 from the four companies which own Southern Peru Copper—American Smelting & Refining, Cerro de Pasco, Phelps Dodge, and Newmont Mining. Production during 1960 is expected to reach the rated capacity of 140,000 tons of blister copper a year.

During 1959 the Cerro de Pasco Corporation explored lead-silver veins in the Zancudo Canyon, Yauyos, continued exploration at the Cobreza copper property in the Department of Huancavelica, and continued work and development of the McCune open pit at the Cerro de Pasco mine. Plans for increasing the electrolytic zinc capacity by 65% were engineered by the staff, and tests were run on Rio Blanco

ore (from Cerro's property in Chile) proving it amenable to conventional flotation.

The Marcona Mining Company appropriated \$22,000,000 for a new beneficiation plant to treat larger quantities of iron ore at its operations around San Juan Bay. Initial plans call for a three-mile conveyor, a new pier, plus crushing and concentrating facilities.

In September the Acari Iron Mining Company made its first shipment of 24,000 tons of iron ore to Bethlehem Steel's operations at Sparrow's Point, Maryland.

The first shipment of manganese from the deposits of the Cia. Manganese Perene at Sochavaca and Pamatigre in eastern Peru were delivered to W. R. Grace & Company in Callao in November. Manganese production from the Azangaro Province declined.

The Santander open-pit mine in the Province of Canta, owned by the St. Joseph Lead Company and the Heller-Rosenshine interests, began production of some 500 tons a day of a lead-zinc ore containing some copper and silver. The Cia. de Minas Buenaventura S. A. began construction on a flotation plant to treat 120 tons of lead-zinc-silver ore daily from their Teresa and Recuperada mines in the Huachocolpa area. Northern Peru Mining & Smelting Company showed interest in several lead-zinc prospects in the Pablo and Chilete districts of Cajamarca province. The Instituto de Investigacion y Fomento Minera and the Banco Minera del Peru studied the possibilities of installing a central smelter and refinery for lead and zinc produced in Peru.

The Andacollo Mining Company Ltd. of Toronto finalized plans for a mill at the Cerro Landa property where a sizable copper deposit has been defined. Other copper properties near Nazca, Ica, and Mala are to be developed by a group headed by Hal Millsap, Jr. of Siloam, Arkansas and Victor Oppenheim of Dallas, Texas. The Compania Administradora de Minas began development of several of its copper properties in the Ajoyana and Antauta districts in the Provinces of Melgar and Carabaya.

During the year chromite was found in Tapo, north of Ayacucho near the bend of the Mantaro River, and the Peruvian Atomic Energy Commission reported the discovery of uraninite at Vilcabamba in the Province of La Convencion, near Cuzco.

Venezuela

The Venezuelan government through its Department of Geology conducted a successful exploration program for bauxite in the State of Bolivar and the Delta

Amacuro Federal Territory. This substantially increases national reserves for the aluminum industry to be established shortly. The government also continued its examination of the San Isidro iron property 10 miles southeast of Cerro Bolivar. Preliminary studies to date, including 8,500 meters of drilling, indicate reserves to be substantial.

The government has set aside the Roscio district in the State of Bolivar as a national reserve zone for the mining of tungsten until January 1961. It has also set aside a 30 kilometer strip adjacent to the north side of the Orinoco River from San Fernando del Estado Apure to the Delta Amacuro Federal Territory as a national reserve zone for the mining of iron.

Metal and Mineral Production In Venezuela in 1957, 1958, and 1959

Commodity	1957	1958	1959
Asbestos ¹	7,611	8,303	4,622
Diamond ²	122,598	89,565	94,985
Phosphate ³	148,584	N.A.	N.A.
Iron ⁴	15,295,543	15,484,543	17,201,277
Manganese ^{1,4}	29,882	8,200	11,937
Nickel ^{1,5}	1,487	2,002	1,348
Gold ⁶	2,788,562	2,364,129	1,672,303
Pyrite ^{1,7}	59,210	14,140	N.A.

1. Metric tons. 2. Metric carats. 3. 30.3 percent P₂O₅. N.A. Not available. 4. 38.2 percent manganese. 5. 1.9 percent nickel. 6. Grams. 7. 25.0 percent sulphur and 2.2 copper.

A Presidential Commission for Guayana (the area south of the Orinoco River) was established to encourage and support new mining ventures in the region.

During the course of the year the government granted 41 concessions for various minerals: 13 for nickel, State of Bolivar, 7 for chromite, State of Falcon, 14 for gold in Bolivar, 2 for iron in Bolivar, 2 for sulphur in Sucre, and 3 for placer gold and diamonds in Bolivar.

New interest in tungsten has been shown in the area of the Botanamo gold mine in the El Callao region, State of Bolivar. Prospectors in the State of Zulia have discovered an important barite deposit. Silver and gold-bearing galena has been reported from the Bruzual District, State of Yaracuy.

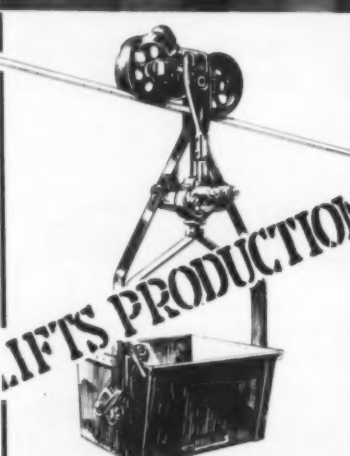
Western Oil Fields Inc. of Denver, Colorado, and its partner, Trans-Western de Venezuela, were rushing development of their El Trueno iron deposit west of Cerro Bolivar in the State of Bolivar. The property is estimated to contain over 132,000,000 long tons of first and second grade ore. A railroad is planned to deliver the ore to the Orinoco River where low-cost water transportation is available.

Peruvian Metal and Mineral Exports In Metric Tons For 1956, 1957, 1958 and 1959

Commodity	1956	1957	1958	1959 ¹
Iron	1,598,000	2,179,000	1,524,000	2,018,000
Zinc	143,700	150,000	136,500	160,000
Lead	118,000	120,000	135,000	118,000
Copper	43,500	49,000	52,400	50,000
Manganese	3,719	4,200	1,967	896
Antimony	1,158	780	580	730
Silver	666	684.4	776	800
Tungsten ²	640	490	526	406
Bismuth	302	340	352	262
Cadmium	13	19	50	81
Mercury	12.2	14	59.4	90.1
Tin	2.1	12	15.5	56.7
Gold	3.2	2.30	2.46	2.61
Tellurium	.04	0	4.13	28.75
Selenium	2.23	2.4	4.23	3.76

1. Estimated. 2. WOs.

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While working a 750' shaft-deepening project from the 2300 to 3050 foot level, the Lucky Friday Mine ran into a dewatering problem which required pumping out an average of 150 to 175 gpm. At the start of sinking operations, air pumps were used, but because of periodic extra volume water seepage and excessive repair and maintenance costs, the air pumps were abandoned in favor of Flygt Model B-80L Electric Submersible Pumps.

In the pumping cycle, a Flygt Pump was lowered to the shaft bottom as soon after each blast as possible, and the water was lifted to relay pumps at a higher level, with heads up to 80 feet. The Mine Engineer, in a paper on the operation delivered before the Northwest Mining Convention, said of the Flygt pumping method: "Although the initial cost seemed high at first, the absence of expensive upkeep and the efficient pumping performance justified the investment. The quiet operation of the Flygt was a decided relief after listening to the siren-like air pumps. The Flygt Electric Pump was a distinct improvement over any type of air pump where large volumes of water had to be moved from the shaft bottom. It was low in upkeep cost and its unusual flexibility made it a definite advantage."

Since shaft sinking was completed, two Flygt Model B-80L Pumps now have become a part of the Lucky Friday's permanent mine pumping installation. In service since October 1956, they still are performing with a maximum of efficiency and a minimum of upkeep.

Additional satisfied users of Flygt Pumps in mining applications include Climax Molybdenum Mines in Colorado, Inspiration Copper Mine in Arizona, Kermac Nuclear Fuels in New Mexico, Boyles Bros. Drilling Co. in Utah, Utah Construction Co. in San Francisco, San Manuel Copper Mine in Arizona, White Cap Gold Mining Co. in Nevada, and others.

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Algeria

Increased production in pyrite (17 percent), zinc blende (14 percent), lead ore (4 percent) and antim ore (26 percent) in 1959, contrasted with decreased output of iron ore and phosphates. The Konif phosphate reserves will be exhausted in a few years, but development of the Djebel, Onk, deposits is under study. In that area, too, there is indication of copper ore.

Construction of a steel mill in the Bone area is still under discussion. Surveying and research have begun at the site of the Belelieta tungsten deposit, where actual mining is to start this year.

In the Sahara, research is under way in the crystalline Hoggar body, where there are indications of wolframite and uranium; in the Yetti body, where uranium, gold, and molybdenum are to be found, and in the Gara Djebilet where iron ore reserves are estimated at 400,000,000 tons (57 percent grade).

Principal Mineral Products in Algeria During 1958 and 1959

Commodity	1958	1959
Iron ore	2,334,700	1,924,000
Lead ore	14,700	15,300
Zinc ore	54,800	62,800
Antimony ore	3,100	3,900
Copper ore	1,600	0,300
Iron pyrites	24,700	29,100
Phosphate of lime	560,900	531,300
Pulverized barite	43,000	31,000
Bentonite	138,000	196,600
Kieselguhr	26,000	26,300

Angola

Although mineral development has lagged behind other industries in Angola, the government's present five-year plan (1959 to 1964) calls for a grant of \$10,000,000 for mapping, geology, and mines. Vast areas in this Portuguese province have been only partly prospected so large scale geological mapping is of vital importance.

Annual diamond production in Angola exceeds 1,000,000 carats—60 percent gem stones with the average value at \$20.00 per carat. Operations are on a large scale, with some 10,000,000 cubic meters of overburden removed annually to mine 2,500,000 of gravel. The Diamond Company of Angola, operating in the northeast section, accounts for more than 80 percent of the country's mineral yield.

Iron and manganese are the second most important minerals in the country, with Cia Minería do Lobita and Cia do Manganês de Angola the chief companies. Mineira's iron ore deposits are at Cassinga and at Quima. The latter has produced hematite at about 20,000 tons a month from shallow workings, and introduced mechanical sizing in 1959. Ore assays about 64 percent Fe, and is low in silica.

At Cassinga, vast resources of banded taconite iron stone, at about 37 percent Fe, plus high grade segregations, are expected to be proved. Future plans reportedly call for a crushing and concentration plant, 60-mile railroad branch line, special loading facilities, and a water-power installation.

The Angola Manganese Company property near Quitota comprises a scattered group of fairly shallow deposits of good grade which do not require concentra-

tion. Many open pits have contributed to production of about 50,000 tons annually.

Copper mining of rich veins at Mavoio in northern Angola has brought annual revenue of about \$1,000,000, but new discoveries are needed to make this mineral of much importance.

Bechuanaland

No new mines were opened during 1959. Chrysotile asbestos production near Kanye, Bangwaketse Reserve, was continued but at reduced levels due to adverse marketing conditions. With improved conditions late in 1959, operations were stepped up again. Production declined to 1,410 from 2,265 short tons in 1958. The two manganese mines, respectively in the Bangwaketse and Bamalette Reserves, markedly stepped up output to 20,138 from 14,213 in 1958. Both mines were installing heavy media separation plants to increase the grade. The Bamalette Company located unknown occurrences in the southwestern area of the Reserve, from one of which the greater proportion of output was mined. Gold production was not quite maintained.

No review of the mining activities of the territory would be complete at this stage without recording a tribute to the persistent efforts of the Geological Survey Department, which is now yielding appropriate reward and receiving due recognition. The more important mineral occurrences have now been examined by the department, which in 1959 continued investigation of the potential coal areas, rendered assistance to operating mines, and conducted mapping and core drilling. The Department is now concentrating on accumulating knowledge of the basic geology and structure of the territory, fundamental to the assessment of its economic potential and to the production of geological map sheets.

A Crown Grant was awarded to Consolidated African Trust covering diamond prospecting in Bامangwato Reserve, and prospecting operations were initiated. Another Grant was awarded for all minerals, except diamonds, in the Bakgatla Reserve to Marlime Chrysotile Corporation, which initiated joint prospecting with another organization late in the year. Manganese rights were awarded to a private individual over an area in the Southern Crown Lands. Rhodesian Selection Trust received a concession covering all minerals excluding diamonds in the Bامangwato Reserve; and active prospecting was scheduled from early 1960. Diamond prospecting rights over restricted areas of Crown Lands were also awarded. In addition, Crown Grants will probably also be awarded for prospecting rights over a large area of the Batawana Reserve. An application has been made for Crown Grants covering diamond prospecting rights over a large area of the northern, central and southern Crown Lands and over the five major Reserve areas in the southwestern Protectorate. Through Anglo American Corporation, De Beers Consolidated Mines continued prospecting in the Lobatsi block, and completed exploration in the Gaberones block. The mineral rights in the two blocks are owned by The British South African Company.

The outlook for mining activity in 1960 is certain in this respect, that there will be markedly increased prospecting activity (which may very well lead to the

discovery of important mineral occurrences in the future), and that known mineral occurrences in the Bامangwato and Bakgatla Reserves, in the southern Crown Lands, and possibly in the Batawana Reserve, will be investigated further.

Belgian Congo

In spite of economic recession and political agitation the mining industry in the Belgian Congo managed to maintain production almost level with that of 1958.

Union Minière Du Haut Katanga resumed its program of expansion and increased substantially its copper production.

As previously announced in this magazine the Société Minière "Somikubi" developed an important deposit of pyrochlore.

The diamond industry maintained great activity in spite of the intertribal troubles in the Kasai. The production of industrial diamonds of Lubilash decreased from 16,000,000 carats in 1958 to 14,196,000 in 1959. The Kasai production, mostly gems, receded slightly from 669,329 to 659,000 carats.

Gold output remained stationary at 10,850 kilograms against 10,957 in 1958. The Compagnie Minière des Grands Lacs opened a rich alluvial deposit and is developing an important primary zone in schists so that production is likely to increase in the following years.

Union Minière raised its copper production from 237,000 metric tons in 1958 to 282,000 tons—a new record. The cobalt output also increased from 6,500 to 8,500 tons, but the production of zinc decreased from 114,000 tons to 69,000 and the roasted zinc concentrate dropped from 120,000 to 110,000 tons. Cadmium production remained almost level at 475 tons. The production of germanium oxide is not available, but in 1958 it had attained 23,425 kilograms.

The output of cassiterite, still affected by the curtailment of exports by the International Tin Council, receded 12,755 tons compared with 13,535 in 1958. The production of colombite-tantalite also dropped from 289 to 255 tons.

The production of wolframite was limited to 749 tons; the price being too low for most of the deposits. Beryl output fell from 964 to 254 tons.

The manganese production was good and rose from 338,000 to 380,000 tons—a new record for the Congo.

Mineral production of the Ruanda-Urundi territory was very small: 1,578 tons of cassiterite, 143 tons of wolframite, 63 tons of colombite-tantalite, and 169 tons of beryl. But a renewed interest was shown for amblygonite whose production rose to 2,690 tons.

The outlook of the mining industry for 1960 is rather uncertain as major political changes are about to occur. Complete independence will be granted on June 30 and the economic future of the country will depend on how it will be run by utterly unprepared natives. If they accept the collaboration and advice of European officials and staffs all may run smoothly. Some of the political leaders seem to seek help from behind the Iron Curtain, but the great majority pronounced themselves in favor of a complete collaboration with the Belgians.

Dahomey

A renewal of prospecting activities, backed for the first time by government financial aid, began in 1959. A joint project of the government and the Bureau Minier de la France d'Outre-Mer started prospecting in the interior of the country for gold in the Natitingou region near the Perma River; the Kandi iron bed, where 500,000 to 1,000,000 tons of low grade ore have been indicated, and in the Bon-tomo area where there are outcroppings of chromite.

The project, which the Bureau (BUMIFOM) is operating, is also conducting investigations for phosphate in the Athieme region; for rutile in the central area including Pohunco, Soassourou, Dgougou and Berni; and for pegmatites. Geological groups studied alluvial deposits at Alibory and at Sota, and in the region west of Tchatchou on the Okpara where beryl bearing pegmatites were located.

A 10-year improvement program established in 1959 will start with a general geophysical prospecting by air. The project will require considerable financing.

Gabon

Development of iron ore deposits in Mekambo and Tchibango continued in 1959 with reserves at Mekambo estimated at 200,000,000 tons containing about 60 percent iron, and at Tchibanga, reserves of 80,000,000 tons, with 43.5 percent iron.

At the Moanda manganese ore property construction of the railroad, aerial tramway, and other facilities was begun by COMILOG (United States Steel Corporation's subsidiary, Cie Minière de L'Ogooue) and mining is expected to start in 1962. Estimated annual output is 500,000 tons.

Exploration of the Mounana uranium ore deposits continued and there are hopes that actual mining will begin in 1961.

Output of alluvial gold was 500 kilograms, the same as in 1958.

Ghana

Being fully aware that the Ghana mining industry is one of the most important factors in the country's economic development, the Ghana government has since independence was granted to this formerly British Territory—made a systematic effort to become more integrated with the various overseas concerns which control the activities of the individual mineral producers.

Considerable progress was made in that direction as negotiations were completed at the beginning of 1959, whereby the Ghana government agreed to grant interest free loans totalling £600,000 to two companies (Amalgamated Banket Areas Ltd.—£450,000, and Bremang Gold Dredging Co. Ltd.—£150,000), both of which are administered by the London-based Western Selection Development Group which also controls Ariston Gold Mines (1929) Ltd., and Ghana Main Reef Ltd. In addition, the government committed itself to a 25 percent participation

in the underwriting of a new £200,000 share issue for Ariston Gold Mines, required for shaft sinking and deep development program to insure the continuity of ore reserves which were about five years ahead of mill requirement at year's end.

A committee was appointed to draft legislation which will make it necessary for diamond miners to sell their output through a State-controlled market in Accra as opposed to the present system whereby most of the output finds its way to the London based De Beers' selling organization.

Perhaps the most far-reaching steps taken by the government in order to insure that the mining industry can continue to expand under private ownership, but under conditions which will enable the government to exercise some measure of control was that, at long last, some progress was made in connection with the Volta River power and aluminum project. United States companies led by Henry J. Kaiser considered the constructional aspects of this scheme in a modified form, and Achinson Howard, the United Kingdom contractors, were chosen to build the access roads for the preliminary works with Kaiser affiliates as the employing authority. At the same time Canadian Aluminium Ltd. was discussing the aluminum side of the scheme and negotiations have taken place with a view to forming a consortium.

1959 was also a notable year for the gold mining industry in that the output of 913,132 troy ounces (852,838 in 1958) constitutes an all-time high. Mainly responsible was Ashanti Goldfields Corporation Ltd. where production reached the new record level of 332,450 (282,530) ounces which is more than one-third of the country's total. Ashanti is one of the world's richest gold mines and, although formed before the turn of the century, future prospects for further expansion are considerable chiefly because exceptionally high values continue to be encountered in development work.

Diamond exports which reached the peak level of 3,255,402 carats in 1958, fell slightly to 3,041,633 carats, but the outlook is for a higher rate of production because the second stage of a new diamond recovery plant at Anincheche being erected by Consolidated African Selection Trust Ltd. will come into operation in July this year. The firm is also installing a large centralized modern plant to replace some of the old and obsolete machinery.

Base mineral exports declined slightly mainly because a lower tonnage of bauxite (162,147 as compared to 180,564 tons in 1958) was shipped. Manganese exports increased slightly from 505,911 tons in 1958 to 515,367 tons, but this tonnage is still 20 percent below the 1957 peak.

Ghana Mineral Exports and Value in 1956, 1957, 1958, and 1959

Commodity	1956		1957		1958		1959	
	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value
Bauxite ²	137,872	£ 331,207	185,403	£ 451,910	207,120	£ 495,808	93,725	£ 232,088
Manganese ²	635,851	7,043,796	641,343	8,990,049	513,069	8,635,858	366,846	4,601,969
Gold ³	599,340	7,488,781	788,151	9,793,511	851,433	10,601,676	591,622	7,399,776
Silver ⁴	(5)	(5)	25,390	8,390	45,762	14,524	8,550	2,770
Diamonds ⁴	2,518,563	7,920,446	2,930,901	8,979,359	3,280,970	8,661,512	2,139,327	6,107,811
Total value		£22,784,230		£28,223,219		£28,409,379		£18,284,414

1. First eight months of 1959. 2. Metric tons. 3. Troy ounces. 4. Metric carats. 5. No returns available.

Ivory Coast

Although 1959 diamond production, 180,000 carats, was slightly lower than for some previous years, prospecting has shown encouraging possibilities and the outlook is favorable. Output of columbite-tantalite totalled 1,000 kilograms. The prospect for metallurgical manganese ore is promising and mining at the rate of 100,000 tons yearly is to start in 1960.

Kenya

The total value of minerals produced in Kenya during 1959 reached an all-time record of £5,319,355.

Due chiefly to the higher price paid for copper during 1959, the value of this metal produced by Macalder-Nyanza Mines Ltd. increased by approximately £75,000, while small increases were recorded in the value of refined gold, limestone products, magnesite, mica, mullite, pumice, refined silver, and vermiculite produced during the year.

During the year, the re-sampling of the columbite-bearing prospect at Mrima Hill was commenced by the Mines and Geological Department and was still in progress at the close of the year.

The Geological Survey, during the course of the year, mapped geologically over 8,500 square miles, bringing the total area so covered to approximately 113,000 square miles, or more than 50 percent of the total area of the Colony.

Kenya Mineral Production for 1957, 1958, and 1959

Mineral	1957	1958	1959
Copper ¹	2,040	2,115	1,982
Diatomite ¹	3,373	4,229	5,608
Gold (refined) ²	7,753	7,387	9,145
Graphite ¹	659	942	566
Kaolin ¹	1,185	1,140	1,145
Pumice ¹	773	2,071	2,249
Salt ¹	18,696	22,602	19,242
Silver ²	44,146	23,051	46,420
Soda ash ¹	118,440	111,038	151,405
Vermiculite ¹	86	30	100

1. Long tons. 2. Fine ounces.

Madagascar

The 1958 downward trend in mining ceased, but there has not yet been a complete reversal and production is still low. Graphite production was 11,000 tons; mica output, 800 tons, and beryl, 350 tons. A little gold, garnet, and columbite-tantalite was also produced.

However, mining of phosphate of lime is scheduled to begin in 1960. A monthly output of 1,000 tons is anticipated initially.

Morocco

Three production records were registered by the Moroccan mining industry in 1959 when output of phosphate, zinc ore, and cobalt ore set new highs for both production and exports.

Phosphates zoomed ahead from 6,335,822 tons in 1958 to 7,163,503 tons. Exports of this primary commodity also reached a new record with 7,026,702 tons, sold mainly in Europe, China, Japan, Formosa, South Africa, and Brazil.

The zinc and lead mines and mills with associated smelters in northeast Morocco enjoyed an excellent year. While lead output was slightly down from 136,936 to 131,996 tons, zinc was well ahead from 86,771 to 101,112 tons while exports were 90,947 and 100,840 tons respectively.

The Oued el Heimer smelter (Zeilidja) produced 28,674 tons of soft lead for export and a total of 38,392 kilograms of silver of which about 36,000 were exported to France.

The Bou Azzer du Grarra cobalt mine east of the Atlas Mountains terminated its first year with new equipment in full operation, with the result that production jumped from 9,259 to 12,071 tons, outstripping exports which had reached only 9,317 tons by the end of the year.

Anthracite and iron ores fell back by approximately 10 and 25 percent. Figures for 1959 were 464,663 and 1,265,022 tons respectively. Sales of the former were relatively poor (198,505 tons exported and 186,966 tons on the domestic market); similarly iron ore met some market resistance with exports at 941,126 tons.

Manganese picked up again, reaching 391,869 tons for metallurgical grade, and 78,698 tons of chemical grades. Exports of the latter were 77,331 tons with the majority (57,493 tons) going to the United States.

Other production figures for 1959, with the previous year's figure in brackets were as follows: iron oxide, 2,107 (1,927); iron pyrites, 14,418 (18,450); copper ore 4,746 (3,874); antimony, 573 (460); strontium, 395 (1,020); tin ore, 16 (9); and barite, 36,808 (42,692).

Mozambique

The Alto Ligonha-Mollocue pegmatite region, 300 miles northeast of Beira, was the most active mining area in this Portuguese province. Considerable amounts of beryl and columbite-tantalite, as well as some tourmaline, mica, and bismuth are produced there by four companies.

The largest, Empresa Mineira do Alto Ligonha, has a number of small opera-

Mineral Production in Mozambique in Kilograms for 1958 and 1959¹

Commodity	1958	1959 ²
Asbestos	367,000	N.A.
Bauxite	2,962,673 ³	4,284,000
Beryl	852,772	1,288,863
Bismuth	800	11,307
Columbite-tantalite	235,874	138,346
Gold	36,000 ³	9,064
Ilmenite	N.A.	7,895,000
Lepidolite	150,000	90,000
Mica	300	5,518
Tourmaline	936	377,540

1. Estimated. 2. Production for three quarters. N.A.—Not Available.

tions centered at Muiane and employing some 1,300 persons. Monthly capacity is about 50 tons of beryl (11 percent BeO) and two tons of columbite-tantalite (about 70 percent combined). In the first quarter of 1959 the company produced 91,453 kilograms of beryl and 1,619 of columbite. Fairly simple mining methods are used.

Other companies operating in this area are the Mineira da Zambezia, Mineira da Marropano, and Mineira de Mocubela.

Nigeria

Being a member country under the International Tin Agreement, Nigeria's production and exports of tin were on a restricted scale in 1959. A larger allocation (5,892 tons) was, however, received than in the previous year when the total permissible exports from December 15, 1957 to December 31, 1958 only amounted to 5,182 tons. This increase was due not only to the quota having been raised but also to the fact that, as from July 1, 1959, Nigeria's percentage allocation of the world total was stepped up from 5.9 to 6.1 percent.

The production of columbite continued to rise and this was reflected in exports as renewed interest was taken in columbite by purchasers. In the first half of the year production was 631 tons but rose to 957 in the second half.

Customary mining of lead-zinc continued, but is comparatively small and totalled some 500 tons for the year. Some progress was made in arrangements for providing capital to start the mine at Abakaliki.

Production of gold during the period was about 950 ounces most of which came from a small local occurrence near Ilesha where the operator has a small stamp mill. Experiments are now being undertaken at the Mines Division ore dressing mill at Jos to advise the operator on better grinding and concentrating apparatus to make a higher recovery.

Special exclusive prospecting licenses were granted in Sokoto and Niger prov-

inces for gold. A suction dredge was fabricated on the Plateau which will be transported to Sokoto, for prospecting gold.

Production of limestone for the Nkalagu cement plant gradually rose from 88,334 tons in the first half of the year to 91,473 tons in the second half of the year. A limestone occurrence in Abeokuta Province in the western region was under development to supply a cement plant being erected in the area.

A producer shipped approximately 1,000 tons of zircon sand to the United States where a market now seems to be established.

A company is being formed to explore and mine deposits of baryte in Benue province. If successful, the ground baryte will be used by those operators exploring and drilling for oil in Nigeria.

Northern Rhodesia

The general improvement in the Northern Rhodesia mining industry which was first apparent toward the end of 1958, continued throughout 1959. All copper mines operated at maximum capacity for the first half of the year to compensate for the seven-week strike of the previous year and record monthly outputs were attained. Normal production was maintained for the remainder of the year, but the net effect was to establish new annual production records. As from July 1, copper production valuation was taken on a "free-on-rail, mine" basis, which is about £22 per long ton of copper below the London Metal Exchange prices previously used for statistical purposes. Making due allowance for the new system of valuation, the metal and mineral production of Northern Rhodesia for 1959 exceeded that of the boom years of 1956, the large increase in copper production more than compensating for the lower selling price.

The big event of the year was the re-opening of Bancroft Mines, Ltd. on the scheduled date of April 1. During the shut down, extensive development proceeded underground, particularly in improving drainage and pumping. On the surface, a number of minor modifications were made in the concentrator to improve operating efficiency. Originally rated at a nominal production capacity of 40,000 tons of copper in concentrate per year, this was later increased to 50,000 tons and at the year end this rate had been reached. Bancroft concentrate is railed to Nkana for smelting.

The Kansanshi copper mine, a relatively small Anglo-American controlled property to the west of the Copperbelt, which was flooded toward the end of 1956, remained closed during the entire year. A large proportion of the copper in the ore is in the form of chrysocolla and although it was generally understood that substantial progress had been made in developing a satisfactory treatment process, this apparently did not justify a resumption of operations.

Rhokana Corporation Ltd. carried out extensive modifications in its Nkana concentrator where all grinding mills were increased in length from 8 to 12 feet and several converted to rod mills—these latter being the first rod mills to operate in the Copperbelt. The changeover to rod milling made possible an appreciable increase in milling capacity. Good progress

Nigerian Mineral Production in Metric Tons and Values for 1956, 1957, 1958, and 1959¹

Commodity	1956		1957		1958		1959	
	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value
Tin	13,364	£7,297,490	13,577	£7,629,174	7,626	£3,937,264	3,504	£1,946,949
Columbite	2,406	1,762,135	1,145	760,677	737	457,229	1,033	617,498
Tungsten	3	4,267	1	297				
Lead	105	8,450	908	97,388	780	54,877	780	38,275
Tantalite	15	20,266	12	21,117	24	44,158	9	15,083
Other minerals ²	749	29,525	662	70,399	530	30,925	46	2,869
Gold ³			230	18,350				
Total Value	£9,122,133		£8,597,402		£4,524,453		£2,620,674	

1. First 7 months. 2. Copper, nickel, chromium. 3. Troy ounces.

was made at the new No. 2 Shaft at Mindola through which it is expected to start hoisting ore early in 1960. The Nkana uranium plant, the only such plant in Northern Rhodesia, was closed following depletion of the uranium bearing ore.

Early in the year Nchanga Consolidated Copper Mines Ltd., made Copperbelt history when a Orenstein-Koppel bucket wheel excavator was started to strip overburden from above the oxidized ore in the Nchanga open pit. The excavator, which has a maximum capacity of about 1,200 bank cubic yards per hour, can dig an 86 foot high face without moving the disposal conveyor. Overburden from the excavator is transported over a 48 inch wide belt conveyor system to an Orenstein-Koppel crawler mounted boom stacker for final disposal. Nchanga, with a monthly production rate in excess of 15,000 long tons of copper, easily maintains its position as premier Copperbelt producer.

Mufulira Copper Mines Ltd., continued active development of the Mufulira West project which will increase production capacity by 50 percent. Originally the intention was to build a separate concentrator, adjacent to the Mufulira West ore hoisting shaft, with a milling capacity of 200,000 tons of ore per month. Further consideration showed a balance of factors in favor of centralizing all milling operations and the existing concentrator is being extended accordingly. Coarse crushing will be done underground and a new fine crushing plant is being erected next to the concentrator extensions. With 16 grinding mills in operation and a throughput of 600,000 tons of ore per month,

Metal and Mineral Production in Northern Rhodesia in 1957, 1958, and 1959 With Value in Rhodesian Pounds

Metal or Mineral	1957		1958		1959*	
	Quantity	Value £	Quantity	Value £	Quantity	Value £
Gold ¹	3,802	36,550	3,673	44,777	4,735	58,219
Silver ¹	534,056	165,728	556,523	172,193	948,459	303,561
Cobalt, metal ²	21,453	1,983,090	20,950	1,877,120	22,817	1,791,215
Cobalt, alloy ²	977	46,862	—	—	—	—
Cobalt, other ²	45,186	464,932	121,186	1,068,830	187,323	1,407,059
Copper, blister ²	169,531	34,200,053	133,423	23,191,913	165,543	34,945,876
Copper, concentrate ²	2,692	119,906	3,206	126,900	258	7,021
Copper, electrolytic ²	246,680	54,416,299	241,526	46,659,091	364,595	82,089,094
Copper, other ²	831	66,981	706	125,844	1,254	266,248
Lead ²	15,000	1,436,559	13,043	949,406	14,400	1,019,330
Manganese ore ²	36,869	479,802	44,595	575,244	56,312	679,482
Selenium ⁴	26,656	106,500	24,805	60,765	32,587	71,753
Zinc ⁴	29,500	2,396,028	30,250	1,994,631	29,895	2,460,489
Uranium oxide ⁴	52,457	—	101,080	—	76,567	—
Beryl ³	5	595	11.44	1,418	—	214
Limestone ³	449,283	376,400	409,917	353,859	477,866	427,812
Mica, sheet ⁴	627	157	1,940	485	253	127
Phyllite ⁴	16,966	2,545	23,694	3,554	21,986	3,298
Amethyst ⁴	—	—	3,798	165	—	—
Cadmium ⁴	56	74,124	17	19,132	—	—
Tin (conc.) ⁴	—	—	—	—	3,233	781
Total value		£96,373,129		£77,225,327		£125,531,579

1. Fine ounces. 2. Hundredweights. 3. Long tons, 2,240 pounds. 4. Pounds. *Preliminary subject to adjustment. NOTE: Copper values based on "F.O.R. at Mine" since July 1, 1960, approx. £22 below London Metal Exchange values previously used.

this will be the largest concentrator in Northern Rhodesia.

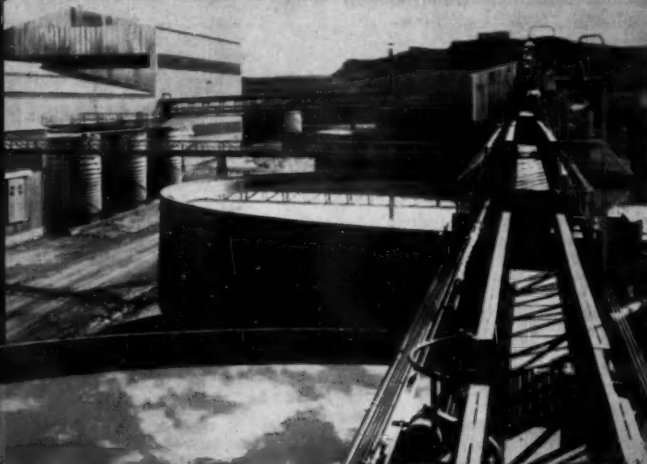
Chibuluma Mines Ltd., plans to mine the Chibuluma West ore body and produce 10,000 tons of 4.7 percent copper ore from there per month. This will increase the milling rate to 50,000 tons of ore per month which has been proved to be within the capacity of the concentrator. All copper concentrate from Chibuluma was smelted at the Mufulira smelter and the copper-cobalt concentrate con-

tinued to be treated at the Ndola cobalt refinery with the production of an enriched copper-cobalt matte for shipment to Europe for further processing.

Roan Antelope Copper Mines, Ltd., with the lowest grade ore, mined and milled the highest tonnage on the Copperbelt. Substantial progress has been made in the sinking of MacLaren shaft, a mile to the west of Irwin shaft, and the headframe, an all-welded structure, was almost completed by the year end. The larger

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part of Roan Antelope blister copper is now refined at the subsidiary, Ndola Copper Refineries, which has a capacity of 55,000 long tons of electrolytic copper per year.

Mtuga mine, the only copper mine not controlled by the two big mining groups in Northern Rhodesia, continued to produce a small quantity of copper concentrate which was shipped overseas for smelting.

Rhodesia Broken Hill Development Co., Ltd., the only Northern Rhodesian non-copper base metal producing mine of importance, continued in steady operation throughout the year. Extensive investigations by the technical staff into possible means of improving lead and zinc recovery ended in a decision to erect an Imperial Smelting Furnace for treating concentrates.

There was an appreciable increase in the quantity and value of manganese ore mined during the year. Production was from the Bahati mine in the Northern Province and from the mines of Gypsum Industries in the Broken Hill district.

Further examination of the undeveloped Chambishi property of the Selection Trust group, revealed relatively large tonnages of oxidized copper minerals above the sulphides and consideration was given to mining by open pit. Work was done to evolve a treatment process.

Attention was also given the Baluba ore body, another Selection Trust property, which adjoins Roan Antelope. With reserves of ore in excess of 100,000,000 tons containing 2.4 percent copper and 0.16 percent cobalt, this is one of world's largest undeveloped potential cobalt sources. The possibility of integrating Baluba operations with those of Roan Antelope received attention.

Nyasaland

The year 1959 continued to be one of exploration only. A well known mining company completed its investigations of the mineral potential of a major part of the Central Province of the Protectorate. The same company carried out, in the early part of the year, detailed investigation into radioactive mineral deposits near Ilomba Hill, Karonga District, in the far north. Final results of this investigation were not released.

Active field work continued, as in 1958, in connection with the ilmenite and rutile deposits in the Lower Shire Valley. A factor which did not permit anything in the way of commercial extraction in the area was the very low price of rutile.

An area of some 4,500 square miles in southern Nyasaland was covered by an airborne geophysical survey from which radiometric and magnetic data were obtained. The interpretation work remains to be done.

A number of prospecting rights were granted to private individuals during the year and an exclusive license for the prospecting of gold in an area of the Southern Province was also issued. Gold is known to exist but it is doubtful whether in marketable quantities.

The government's Mineral Investigation Section conducted a detailed survey of kyanite deposits in the Ncheu District and of a deposit of rare-earth minerals at Kangankunde in the Zomba District; diamond drilling being undertaken in both cases. Beneficiation trials, or tests of

samples obtained, were to be undertaken. Research was also conducted in respect to apatite carbonatite and associated minerals in the Tundulu area south of Lake Chilwa.

The only mineral produced and exported during the year was a small quantity of mica: 3,600 pounds were exported; 250 in 1958.

Senegal

Phosphate of alumina was the main mineral product, with 85,300 tons mined compared with 104,500 tons in 1958. Ilmenite production is still slow (30,000 tons) as well as zircon (9,000 tons). Both are extracts of titaniferous and zirconiferous sands and do not contain a high quality of rutile. Mining of a tested deposit of phosphate of lime is scheduled to start soon, and estimated output is 650,000 tons yearly.

Sierra Leone

The year 1959 is considered to have been the best year ever for mining. The Sewa River was at its lowest point ever and advice was available (from the Mines Department) to diamond miners on the building of dams (a record number were built) and diversion cuts; but it is unfortunate that efforts to persuade tributaries to cease the dangerous practice of skin diving were not very successful. Assistance was also given in the maintenance of pumps and the ordering of spare parts. The Mines Department made its greatest efforts to insure that all possible swamp areas and terrace deposits were licensed for mining during the rains, and over 7,000 men were at work in three of the chiefdoms bordering the Sewa River.

For the first time since the advent of the Alluvial Diamond Mining Scheme the staff of the Mines Department was almost up to strength which made it possible for three Inspectors of Mines to devote their whole time to assisting the alluvial miners in improved mining methods by the digging of series of parallel trenches instead of haphazard pits, and by concentrating gravels by rockers, screens, and jigs.

Under the Alluvial Diamond Mining Scheme six more chiefdoms were declared for mining, bringing the total to 48 covering an area of approximately 7,000 square miles. Also, the creation of the Government Diamond Office at Kenema, opened by the Governor August 4, appears so far to have had the desired effect of decreasing the smuggling of diamonds since the value of sales to the Government Diamond Office (now the only licensed exporter of diamonds mined under the Alluvial Diamond Mining Scheme) in the last four months of 1959 was over one and one-

third times greater than the value of sales to the (then) three licensed exporters during the same period of 1958.

Illicit mining within the Sierra Leone Selection Trust leases at Yengema and Tongo was kept under better control by the determined measures taken by the government to combat this menace. The company again increased its output of diamonds, thanks to the new plant at Tongo, and modernization of plants in Kono. The use of more earth-moving machinery enabled ground which would have been considered uneconomic a few years ago to be mined with good results.

The scheme of contract mining by African miners within the company's leases was extended. African miners are given the chance to mine in a systematic manner under expert supervision. The company pays 60 percent of its profits to government revenue and, from July 1958 to June 1959, the estimate of taxation to be paid to the government amounted to £1,144,000 which is £430,000 more than in the previous 12 months.

The production of saleable lump chromite ore near Hangha by the Sierra Leone Chrome Mines in 1959 was almost 20,000 tons. The mill was shut down throughout the year and no concentrates were produced. Unfortunately only 5,000 tons of ore valued provisionally at £250,000 were exported because of the difficulty of placing contracts on the refractory market.

The production of iron ore at Marampa by the Sierra Leone Development Company was the highest since production began in 1933, and during the year 1,596,605 tons of iron ore were shipped to Europe and the United States. A record month's total of 182,475 tons of iron ore was shipped from Pepel in December on 17 ships. The new mill at Marampa to treat 1,500,000 tons of concentrates a year was opened by the governor in March 1959. The development of the iron ore deposits at Tonkolili, some 60 miles northeast of Marampa awaited the necessary finance of £20,000,000. In this connection, among others, delegates of the British Iron and Steel Corporation and the West German iron and steel industry visited Sierra Leone during 1959.

Reconnaissance drilling for rutile by the Consolidated Zinc Corporation in partnership with the Columbia Southern Chemical Corporation within the area of their Special Exclusive Prospecting License of 2,360 square miles in Pujehun, Bonthe, Bo and Moyamba districts was continued throughout the year. In November the Titanium Agreement of 1959 was enacted and actual mining of rutile is expected to begin within the next three years.

The Aluminum Company of America and the Kaiser Aluminum and Chemical Corporation of the United States carried out prospecting for bauxite in various parts of Sierra Leone but both companies were doubtful whether sufficient tonnages

Sierra Leone Mineral Exports and Value for 1956, 1957, 1958, and 1959¹

Commodity	1956		1957		1958		1959	
	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value
Diamond ²	647,797	£3,457,385	863,202	£6,615,541	1,490,037	£7,183,787	777,552	£3,980,392
Iron ore ³	1,328,019	4,003,016	1,444,542	4,265,982	1,420,436	4,359,981	720,001	1,980,793
Chrome ⁴	18,774	194,630	170,198	170,198	11,211	114,847	—	—
Gold ⁴	400	4,741	—	—	—	—	—	—
Total Value		£7,659,772		£11,051,721		£11,658,615		£5,961,185

1. 1st 6 months. 2. Metric carats. 3. Metric tons. 4. Troy ounces.

of ore could be proved to justify mining. A little prospecting was continued for gold and platinum mining by Sierra Leoneans.

Southern Rhodesia

Though there is a distinct time lag between metal market fluctuations and their effect on mineral production in Southern Rhodesia, the fact that the total value of the output for 1959 remained at the record figure of £25 million indicates the buoyancy of the industry in the country in spite of recent recessionary trends elsewhere. Perhaps the principal reason lies in the diversity of minerals produced, and an examination of the annual statistics in this connection is revealing.

For example, in addition to 2,754 blocks of precious metal claims, the following mineral and metal claims were held at the year end: aluminum, antimony, arsenic, asbestos, barium, beryl, chrome, columbium-tantalum, copper, iron, pyrite, lead, lithium, manganese, mica, molybdenum, thorium, nickel, phosphate, tin, tungsten, uranium, and a wide variety of building materials, refractories, and fluxes. There was production of all these excepting aluminum and zinc.

A brighter outlook for chrome producers was prevalent at the year end. Increasing interest is being shown in fine cluvial chromite which constitutes about 10 per cent of the soil over enormous areas of the Great Dyke. Difficulties experienced in the separation from other heavy minerals are being overcome.

Rio Tinto's successful take-over bid for the country's main gold producer, the Cam

Metal and Mineral Production and Value in Southern Rhodesia in 1957, 1958, and 1959

	1957		1958		1959	
	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value
Gold ¹	536,849	6,663,635	554,838	6,886,929	566,882	7,036,429
Gold premium ²		84,672		63,373		44,833
Silver ¹	74,179	24,219	264,630	83,392	328,947	107,782
Antimony ore ³	139	12,481	251	10,504	173	9,068
Arsenic ³	883	6,260	683	3,774	528	1,742
Asbestos ³	132,124	9,016,388	127,115	8,593,726	119,699	7,405,258
Beryllium ore ³	572	63,751	332	33,822	440	44,796
Chrome ore ³	654,077	4,517,500	618,845	3,976,538	543,107	3,030,564
Columbite ore ³	38	126				
Copper ³	1,118	254,444	8,430	1,003,692	12,017	2,007,728
Corundum ³	4,506	29,329	4,594	29,378	2,799	18,782
Fluorspar ³	97	339	5	25	10	40
Iron ore ³	148,768	27,903	759,506	29,942	143,001	26,812
Lead conc. ³	43	2,194				
Lithium						
Amblygonite conc. ³	121	3,213	1,835	39,700	N.A.	N.A.
Eucryptite	56	1,200	398	6,940	N.A.	N.A.
Petalite ore ³	9,934	48,987	13,166	65,830	N.A.	N.A.
Lepidolite ore ³	93,545	380,767	64,699	323,445	N.A.	N.A.
Spodumene ³	5,599	19,536	5,238	20,952	N.A.	N.A.
Magnesite ³	2,910	4,365				
Manganese ore ³	1,785	893	2,512	1,256	2,126	1,063
Mica block ⁴	70,044	23,787	107,730	36,559	104,937	25,877
Nickel ore ³	359	21,020	17	425		
Tantalum conc. ³	38.48	41,762	48	76,809	58	66,861
Tin conc. ³	47.44	19,461	48	19,424	53	22,831
Tungsten conc. ³	167	91,602	95	22,593	34	14,960

1. Fine ounces. 2. By government. 3. Short tons. 4. Pounds. N.A. Not available.

and Motor mine, was the major incident in the industry during the year and the cause of considerable speculation. Earlier, the Rio Tinto company had taken up two smaller producers, the Patchway and Big Ben properties, which though in the same district of Hartley, lie some distance from the Cam and Motor. It has not been vouchsafed by the new owners whether any major change in policy is proposed.

New Consolidated Goldfield's Motapa mine closed down after twelve dividend free years of operation. At the same time

the parent company purchased a high grade property in the same district, the Barberton.

The value of lepidolite, spodumene, and other lithium minerals no longer featured in the official annual returns and is presumed to be included under "other minerals"; a heading not hitherto employed.

It was reported early in the year that Bikita Minerals Ltd., the principal producer and owner of what is reputed the world's largest lithium deposit, would be going on to a care and maintenance basis at the year end. Instead, the company purchased

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Africa

the neighboring claims for the sum of £400,000, and it is expected that the scale of production will now be increased.

Considerable interest in copper continued to be shown by the larger groups, who hold considerable areas in Lomagundi under exclusive prospecting orders.

The output from the Messina Company's mines, Mangula and Umkondo, continued to increase, and it is understood that operations will shortly commence on the Sanyati claim, formerly the Copper Queen. Work on the Alaska mine and smelter is also going ahead.

The high quality emerald deposits at Sandwana in the Belingwe district were purchased by the Rio Tinto Company during the year, but their production policy has not so far been announced.

Production Sales and Sales Value of Important Metals and Minerals Produced in South West Africa in 1957, 1958, and 1959*

Commodity	1957 Production	1957 Value	1958 Production	1958 Value	1959 Production	1959 Value
Diamonds ¹	996,610	£15,912,796	903,576	£13,989,707	930,659 ²	£15,304,607
Lead ³	86,946	—	82,535	8,136,621	68,535	(6)
Copper ⁴	29,835	(6)	30,818	(6)	33,773	(6)
Zinc ⁵	62,000	(6)	44,728	(6)	21,586	(6)
Manganese ore ⁶	89,661	1,026,442	103,050	1,361,389	49,442	435,500
Lithium ore ⁶	6,743	97,014	8,973	57,300	5,197	26,825
Silver ⁴	1,789,323	(6)	1,719,990	(6)	1,996,955	(6)
Tin conc ⁶	634	289,000	208	93,200	(6)	N.A.
Cadmium ⁶	1,420	(6)	1,344	(6)	647	(6)
Cesium ore, pollucite ⁶	N.A.	N.A.	67,260	300	54,000	365
Beryl ore ⁶	386	37,020	246	29,227	170	12,736
Germanium ⁶	—	(6)	7	(6)	8	(6)
V ₂ O ₅	505	N.A.	524	4,007	N.A.	195,298

*Records of Government Mining Engineer. 1. Metric carats. 2. 819.352 carats gem stones. 3. Short tons. 4. Troy ounces. 5. Pounds. 6. In complex concentrate with total value of £9,148,067. N.A. Not available.



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South West Africa

In the 1959 mining returns of the territory features were few and far between. Gem diamond production and sales alone sparkled; and improvements were recorded in copper, lepidolite, vanadium-lead concentrates, and the complex lead-copper-zinc concentrates in the aggregate sales value.

In the diamond sector, Consolidated Diamonds electrified and doubled its rail facilities to accelerate and expand field-plant operations. A new continuous grease-belt recovery plant and diamond sorting-house were commissioned. Consolidation rather than expansion was the keynote of exploration and prospecting. In the northern districts, De Beers Consolidated Mines maintained its operations. A smaller producer—of industrial diamonds, the Industrial Diamond Company—while not quite maintaining previous output, was formulating plans to purchase a cutter-suction dredger in a program to mine a 12-mile terrace with estimated reserves of 4,000,000 carats at an expected yield of about 7 carats per 100 cubic yards.

By selective operations, the Tsumeb Corporation Ltd.—producer of the complex concentrates—scaled down output of lead and zinc, but raised copper and silver production. The corporation was erecting the first copper refinery in the territory for operation on a custom basis.

The South West Africa Company, producer of vanadium-lead concentrates, stepped up operations at Berg Aukas where metallurgical tests and exploration were continued and a new flotation plant was commissioned. At the company's Brandberg West tin/tungsten deposits, the plant was modified to handle 20,000 tones of ore a month. S.A. Minerals continued limited production of manganese ore from development operations which were extended further in its extensive holdings.

S.A. Iron and Steel Industrial Corporation was another of the major interests to stake a claim in the territory when it acquired the tin mine and mining rights of the now defunct Uis Tin Mining Company.

Tanganyika

The value of mineral production in Tanganyika in 1959 set a new record and exceeded £7,000,000 for the first time. Diamond exports, as usual, headed the list with a total production of 54,670 carats

valued at £4,547,000. This was an increase of over £130,000 above the value for 1958.

A very substantial rise in the value of refined gold exports was a notable feature of the year; 85,403 ounces of gold were exported with a value in excess of £1,000,000. The comparable figures for 1958 were 56,299 and £705,000.

At the Williamson Diamond Mines Ltd. the treatment plant had an average throughput of 6,600 tons per day, a figure which was achieved by the use of a large 48 by 60-inch crusher installed to handle large boulders.

The Geita gold mine had a successful year with increased gold recovery figures; the Kibakari mine in the Musoma district which went into production in February operated efficiently. The Ntumbi mine in the Chunya District encountered water difficulties underground and mechanical trouble in the mill. A considerable number of small scale workings continued in this district and produced a total of 912 ounces of gold.

The Mpanda mine of Uruwira Minerals Limited is due to close for lack of ore reserves in mid-1960. This mine has been one of Tanganyika's most successful mineral producers, but all efforts to find possible extensions of the ore zone were unsuccessful.

Export of Metals and Minerals from Tanganyika in 1958 and 1959 and 1959 Value

Commodity	1958 Quantity	1959 Quantity	1959 Value £
Copper ore ¹	—	126 ²	2,250
Diamonds ³	515,453	554,670 ⁴	4,547,737
Gold, refined ⁵	56,299	85,403	1,067,218
Gypsum ¹	9,152	6,758	14,446
Lead concentrates ⁴	13,501	12,500 ⁶	944,500
Lime ¹	495	139	886
Magnesian bentonite ¹	77	35 ³	350
Magnesite ¹	301	105 ³	197
Meerschaum ¹	4,925	13,865 ³	699
Mica, sheet ¹	48,478	51,788 ³	52,194
Salt ⁴	8,849	12,142	114,679
Silver, refined ¹	18,552	22,818	7,511
Tin concentrates ¹	26,20	93,21 ⁸	50,024
Vermiculite ¹	37	—	—

1. Long tons. 2. Metric carats. 3. Ounces.
4. Metric tons. 5. Estimated.

The Mbeya Exploration Company Limited continued work throughout the year on the beneficiation problems of its columbite ore from Panda Hill. No decision had been announced at year-end regarding the full scale operation of this property.

Prospecting activity during 1959 remained high. Some 34,000 square miles under exclusive license to the Western Rift Exploration Co. Ltd. were examined and there was particularly increased interest in gold showings in the Lake Province. The Minjingu phosphate deposit, near Arusha, was further evaluated by New Consolidated Goldfields Ltd., but reports state that transport cost of the material will be the critical factor.

Despite the scheduled close of the Mpanda lead mine, the mining industry in Tanganyika continues to make steady progress and the increased value of production together with the continuing high level of exploration shows the expanding international interest in the country's mineral possibilities.

Uganda

As in 1958, copper continued to be by far the largest mineral export from Uganda in terms of both tonnage and

Comparative Value of Mineral Production in Uganda in 1957, 1958, and 1959 Value in £ Sterling

Commodity	1957	1958	1959
Copper (blister)	1,500,000	2,137,000	2,711,000
Tungsten	142,000	5,000	5,200
Tin	30,000	27,000	31,000
Beryl	9,000	7,400	21,000
Gold	2,000	3,500	4,200
Columbium-Tantalum	4,400	3,000	500

value in 1959. At Kilembe Mines Limited, the new milling capacity of 60,000 tons per month was reached and 11,800 tons of blister copper was produced having a value of some £2,700,000. Mining of the oxide deposit at Kilembe by open pit methods facilitated smelting and gave a greater potential capacity to the company's smelter at Jinja.

Geological mapping and prospecting within the Kilembe license area established the continuation of the copper-cobalt rock series well beyond the existing mine workings.

Four of the six wolframite producers who closed their mines in 1958, reopened on a commercial scale when the price of wolfram reached 165 Shillings per unit in September.

Work on the phosphate deposits at Sukulu was suspended following the completion of ore treatment tests. These demonstrated the feasibility of the beneficiation methods used but efforts to raise capital for the mining of this very large deposit (phosphate and columbium) have so far failed. A small scale scheme for the production of fertilizer for local consumption is being considered.

The buying contract between the United Kingdom Atomic Energy Authority and the British Metal Corporation, together with the activities of the Authority's field geologist, brought about an intensification of development and exploration for beryl. Value of beryl produced during the year was over £20,000 compared to £8,000 in 1958.

Almost the entire production of gold in Uganda came during the year from

the Busia area of the Eastern Province. The output, valued at £4,000, is still small.

The pattern of mining in general during the year remained as previously, there being one major producer only (Kilembe copper mine). The remainder of the industry is in the hands of relatively small scale operators.

South Africa

New record levels were reached in 1959 by the gold mines in all aggregate aspects. Continued expansion by the new mines and increased milling by most of the medium-term mines more than offset contraction by the older producers of the Witwatersrand, many of which were nearing the end of long lives.

Generally, the new mines of the Far West Rand, the Klerksdorp, and Free State fields advanced to the stage where ore reserves had been built up to tonnages permitting expansion of milling rates, while development programs could be extended into new sections and additional shafts sunk to open up new zones (thereby facilitating further expansion of milling to projected ultimate rates) and/or increase ventilation capacities required for both current operations and the extension of underground operations, in some cases to greater depth. In certain instances, refrigeration units were installed or expanded.

In 1959, production and sales of uranium oxide were maintained near the aggregate contractual level of 6,200 tons a year (for the Combined Development Agency of the United States and United Kingdom) compared with the aggregate output capacity of about 7,200 tons. Providing the demand is there, most of the uranium producers are expected to be competitive in the post-contract period. An intensive program of research was initiated to reduce costs of uranium recovery, to improve the processes of extraction, and to investigate greater refinement of the finished product, in-

Metal and Mineral Production for the Union of South Africa in 1955, 1956, 1957, 1958, and 1959

	1955 Production	1956 Production	1957 Production	1958 Production	1959 Production	1959 ± Value
Gold ²	14,601,404	15,896,693	17,030,737	17,656,447	20,065,515	230,136,128
Diamonds ²	2,628,917	2,585,728	2,578,975	2,702,250	2,838,332	N.A.
Silver ²	1,461,536	1,582,045	1,767,472	1,795,384	2,020,780	662,781
Osmiridium ²	7,094	6,586	5,361	4,811	5,290	56,700
Copper ²	49,239	51,253	50,959	54,615	55,310	9,562,547
Ni ^{1,4}	2,147	2,887	2,915	2,892	N.A.	N.A.
Antimony conc. ¹	24,834	24,897	17,546	12,859	22,155	1,031,267
Beryl ore ¹	137	133	711	462	203	12,106
Bismuth ore ¹	0.16	580	220	2.0	0.42	—
Chrome ore ¹	597,372	690,855	733,616	696,061	749,878	2,869,764
Iron ore ¹	2,203,429	2,375,497	2,293,103	2,438,713	3,187,029	2,687,497
Lead ore ¹	758	1,340	1,834	71	230	5,766
Manganese ore ¹	649,475	768,400	787,883	934,103	1,069,202	4,337,598
Tungsten conc. ¹	646	304	262	76	37	14,265
Andalusite ¹	19,359	30,244	17,799	14,587	3,744	30,053
Asbestos ¹	119,698	136,521	157,465	175,643	182,405	9,606,273
Barite ¹	1,892	2,713	3,369	2,721	2,355	9,031
Corundum ¹	834	2,068	1,566	2,118	622	16,917
Fluorspar ¹	32,839	35,065	35,106	48,251	70,317	347,846
Graphite ¹	1,829	1,862	1,750	875	617	9,987
Kaolin ¹	11,275	11,621	15,823	26,592	10,758	24,349
Magnesite ¹	19,753	33,485	35,414	80,200	58,883	89,875
Mica ¹	3,914	2,520	2,114	2,127	1,881	16,204
Talc ¹	1,581	1,968	2,314	765	1,412	5,076
Vermiculite ¹	47,904	58,717	62,619	54,319	52,398	425,800
Platinum group metals ²	381,732	484,574	—	N.A.	—	N.A.
Lithium ore ¹	426	713	30	—	—	—
Pyrite ¹	398,849	481,560	434,802	552,366	554,835	1,613,387
Uranium oxide ²	—	—	11,398,214	12,491,337	12,888,740	48,731,848
Vanadium	—	—	16	599	581	461,123

* Records of the Government Mining Engineer. Value does not always accurately reflect production because in one year all production may not be sold; in another year sales may include previous year's production.
1. Short tons. 2. Fine ounces. 3. Metric carats. 4. Metal and concentrate. 5. Estimated. 6. Pounds.
N.A. Not available.

Africa

cluding the possibility of extending the final stage to the production of uranium metal.

If anything, prospecting for gold deposits was intensified in 1959, in the Southern Transvaal and in the Orange Free State north of Bloemfontein. In the Kinross area of the Eastern Transvaal, west of the Winkelhaak mine, the Bracken and Leslie mines were established, which, with respective indicated grades of 450 and 350 inch-dwts, in relatively shallow formations, are expected to reach initial production in the 1963 to 1964 period. The lease area of the new Western Areas mine, south of Randfontein, was delineated with an indicated grade of about 560 inch-dwts. Another mine-zone has been partially proved in the Kinross area,

and another in northern Free State south of Vaal Reefs mine. The Zandpan mine began sinking its first shaft. Western Deep Levels, also shaft-sinking, expects to initiate milling late in 1962.

Asbestos: Sales in the early part of 1959 reflected adverse economic conditions and import restrictions in the exports markets. Later they recovered. It appears that fibre output was held back to reduce accumulated stocks, especially by the chrysotile producers. On balance, output capacity was expanded. In one Northern Transvaal area, a number of small producers were merged under the control of a major producer.

Antimony: The country's solitary producer in the Gravelotte area reported higher output, better sales; extended its

claim area, and resumed exploratory development.

Chromite: With surpluses much in evidence, production was held well below capacity, or temporarily suspended, to dispose of accumulated stocks. One producer sold a controlling interest to Allied Chemical Corporation of New York, New York, with which it arranged a long-term contract.

Copper: Production was held below capacity, with operations directed towards improving potential or actual producing facilities and towards effecting economies and raising efficiencies. In the Letaba area, pilot test runs were conducted on copper-zinc ore.

Manganese: Mining rights were extended, and new workings opened, mainly to supply the increased and increasing domestic demand. Rail facilities were extended in the Postmasburg area, Northern Cape, to handle greater tonnages.

Iron ore: With export conditions improving in the closing stages—in respect to steel, pig-iron and ore—production continued on the uptrend, especially in the Postmasburg-Sishen area of the Northern Cape. The major expansion program of the country's major steel producer was advanced further.

Phosphate: One company installed a washing plant to improve output at lower unit costs. The country's major producer at Phalaborwa in the northeastern Transvaal modified and extended its plant—including the flotation section; and started mining lower grade zones in a program aiming at doubling output, eventually satisfying all domestic requirements, and possibly providing a surplus for export.

Its contract ended, a producer of thorium concentrates in the northwestern Cape was placed on a caretaking basis. Plans were being formulated for producing titanium pigments from Umgababa Minerals' output on the Natal South Coast, with production scheduled for 1962 in a 10,000 ton-a-year plant. An extensive survey of the country's beryllium deposits was initiated. An unexciting year for tin saw exploratory and normal development advanced with satisfactory results, and producing facilities were improved both underground and on surface, where plant modifications and new installations raised extraction efficiencies.

For diamonds, 1959 was largely a period of arrangements and consolidating agreements for the South African industry. Legislation amending the Precious Stones Act of 1927 was tabled in Assembly for enactment, to clarify and improve conditions in respect to capital expenditure and working costs, and to promote the expansion of production and the extension of exploration.

Banner headlines were accorded the Adamant Laboratories of the De Beers group in Johannesburg for their successful development of a process to synthesize diamond grit on an economic commercial scale. Any decision to embark on that will be taken in conjunction with Societe Miniere du Beceka of the Congo. Research continues.

The De Beers group also extended operations in Namaqualand and South West Africa, but on balance South African production and sales were only slightly more than maintained. In the Western Transvaal, a minor company reported much better development results, and prepared to expand production on a more efficient basis.



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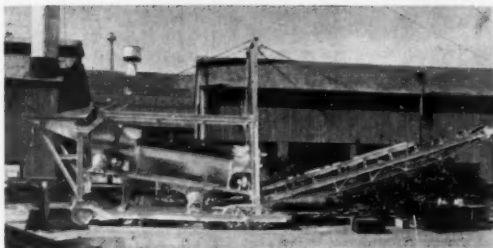
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- 1-36" x 72" long Jeffrey Traylor Grizzly Pan, 440 V.
- 1-Model GF-22-24 Syntron "Weigh Flow," 440 V. Exc.
- 1-36" x 6' Stephens-Adamson Recip. plate
- 1-36" x 8'-4" Link Belt Apron, 3 H.P.
- 1-4' x 8' Jeffrey Vibrating Feeder, 440 V.

FILTER

- 1-3 x 4 Oliver Continuous Drum, with Vacuum Pump
- 1-6'-2" disc. Elmcro, with motor & drive
- 1-6'-3" disc. Elmcro, with motor & drive
- 1-6'-5" disc. Oliver, with motor & drive
- 1-6'-6" disc. Oliver, with motor & drive.

FLOTATION MACHINE

- 1-1 cell 44" x 44" Wemco Fagergren, steel tank
- 1-5 cell 44" x 44" Wemco Fagergren, steel tank
- 10-2 cell 56" x 56" Fagergren, steel tank, 10 H.P.
- 2-3 cell 56" x 56" Fagergren, steel tank, 10 H.P.
- 4-6 cell No. 18 (32" x 32") Denver Sub A.
- 1-6 cell No. 18 sp. (32" x 32") Denver Sub A.
- 1-9 cell No. 18 sp. (32" x 32") Denver Sub A.
- 1-8 cell No. 18 sp. (32" x 32") Denver Sub A. steel tank, 10 H.P. motor
- 1-5 cell No. 18 sp. (32" x 32") Denver Sub A. steel tank, 7 1/2 H.P. motor
- 1-1 cell No. 250 (32" x 32") Denver Unit cell, 5 H.P. motor
- 1-8 cell 36" x 36" Galigher Agitair, steel tank, 7 1/2 H.P. motor
- 7-2 cell 48" x 48" Galigher Agitair, steel tank, 15 H.P. motor

HOISTS, MINE SHAFT

- 1-600 H.P. Vulcan double drum mine shaft, 20,000 at. 1500 fpm. complete with controls, dynamic braking, 2300 V. excellent
- 1-200 H.P. Couer d'Alene Single drum, 440 V.
- 1-75 H.P. W.A. Box Single Drum, 440 V.
- 1-75 H.P. Puget Sound Single Drum, 440 V.

HOPPER

- 1-14 1/2" x 15' x 10' deep Dump Hopper station complete with hydraulic operated grizzly 48" x 8" plate feeder, 10 H.P. gearmotor

JIGS

- 2-26" x 26" Bendalari Simpler mineral jig
- 1-2 cell 42" x 42" Yuba Model 8
- 14-4 cell 42" x 42" Yuba, Model 8, 3 H.P.
- 1-1 cell 12" x 12" Pan American, PEL
- 1-6 cell 10" x 10" Pan American steel tank
- 1-2 cell, 24" x 24" Yuba, Model J-1, 1 H.P.

KILN

- 1-48" x 30" Hardinge Rotary, XL2

LOCOMOTIVES

- 5-1 1/2 Ton Mancha "Little Trammer" Battery, 18"-24" Complete
- 1-1 1/2 Ton Atlas Battery, 24" ga. Batteries
- 1-3 1/2 Ton Mancha Titan AX Battery 18" ga.
- 1-4 ton Mancha Titan AX Battery 24" ga.
- 1-7 Ton Plymouth Diesel, 18" ga. scrubber

MILL, BALL AND ROD

- 1-4 x 10 Marcy Rod Mill, 75 H.P. motor 440 V.
- 1-5 x 10 Marcy Ball Mill, 100 H.P. motor 440 V.
- 5-8 x 9 Traylor Ball Mill, 250 H.P. Syn. Motor
- 1-5' x 8' Traylor Rod Mill, 150 H.P. 440 V.
- 1-6' x 16" Hardinge Conical Ball Mill, 50 H.P.

MUCKING MACHINES

- 7-#12B Elmcro Loaders, 18" ga.
- 1-#25B Elmcro Loaders, 18-24" ga.
- 6-GPH Gardner Denver Loaders, 18" ga.
- 1-HL3 Sullivan Loaders, 18" ga.

PUMPS

- 1-14" Yuba Centrifugal, 5500 gpm, 250 H.P.
- 1-14" Yuba Centrifugal, 5500 gpm, 125 H.P.
- 1-10" Yuba Centrifugal, 2400 gpm, 75 H.P.
- 2-16" Wintroath deepwell, 2000 gpm, 100 H.P.

PUMPS DIAPHRAGM AND SAND

- 2-8" Dorco Duplex Type W, 5 H.P. TEFC motor
- 3-6" Dorco Duplex, Type VM, 3 H.P.
- 3-6" x 6" Allis Chalmers Sand, NRELOR, 30 H.P.

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- 6-MI-418 Carco Magnetic separator
- 1-D-1A Exolon, 3 unit Vertical Roll type
- 1-HS-418 Carco High Tension Separator
- 1-HS-218 Carco High Tension Separator
- 4-HT-460 Carco High Tension Separator
- 1-Memco-Hope Magnetic Separator, 16 1/2" x 12" type CB

SEPARATOR, DRUM

- 1-30" x 75" Type WPD Stearns Magnetic Drum

SCREENS

- 1-9' dia. x 54'6" Yuba Trommel, 100 H.P.
- 4-4' x 12' Tyler Ty-Rock, 1 deck, F600, 10 H.P.
- 1-4' x 8' Symons Rod Deck, Type K, 7 1/2 H.P.
- 1-3' x 6' Allis Chalmers "Aero-vibe" 2 H.P.
- 2-4' x 10' Tyler "Hummer" Vibrating, complete

SHOVELS

- 1-Model 111M Marion Diesel electric, 4 yd. Shovel front, 100 ft. dragline boom and 3 1/2 yd. bucket
- 1-Model 170B Bucyrus Erie, electric 7 yd. 375 H.P. AC motor, 2400/4160V & Esco Bucket

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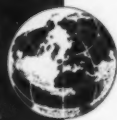
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1960 ORE BUYERS' GUIDE

Possible Markets for: ORES, METALS, NON-METALLICS

As compiled from lists furnished by the Division of Minerals, U. S. Bureau of Mines, and ore and metal buyers

ANTIMONY

American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Associated Metals & Minerals, 75 West St., New York 6, N. Y.
Churquini Enterprises, 67 Wall Street, New York 5, N. Y.
Derby & Co., Inc., 10 Cedar St., New York 5, N. Y.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R., Hanover Square, New York 8, N. Y.
Harshaw Chemical Co., 1945 E. 97th Street, Cleveland 6, Ohio
International Metal Corp., 607 Fifth Avenue, New York 17, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
McGean Chemical Co., 1010 Midland Building, Cleveland 15, Ohio
Metal & Thermit Corp., 100 E. 42nd Street, New York 17, N. Y.
Metal Traders, Inc., 47 Wall Street, New York 5, N. Y.
Metro Smelting Co., Ontario & Bath Sts., Philadelphia 34, Pa.
National Lead Co., 111 Broadway, New York 6, N. Y.
Philipp Brothers Ore Corp., 70 Pine Street, New York 5, N. Y.
South American Mineral & Merchandising Corp., 445 Park Avenue, New York 22, N. Y.
Southern Lead Co., 2500 W. Moreland St., Dallas, Tex.
C. Tennant, Sons & Co., 100 Park Avenue, New York 17, N. Y.
Nathan Trotter & Co., 36 North Front Street, Philadelphia 6, Pa.
Wah Chang Corporation, Woolworth Building, New York 7, N. Y.
Watson Geach & Co., Inc., 25 Broadway, New York 4, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

ASBESTOS

American Asbestos Textile Corp., Strawbridge & Sterigere Sts., Norristown, Pennsylvania
Armstrong Cork Co., 1910 Concord St., Lancaster, Pa.
Carolina Asbestos Co., Davidson, North Carolina
Ehret Magnesia Mfg. Co., Valley Forge, Pennsylvania
Flintkote Co., 4111 R.C.A. Bldg., New York 20, N. Y.
Garlock Packing Co., 250 Main Street, Palmyra, New York
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Jahns Manville Sales Corp., 22 E. 40 Street, New York 16, New York
Kearney & Mathison Co., Ambler, Pennsylvania
Mundet Cork Corp., 7293 Tonnelle Ave., North Bergen, N. J.
Pabco Products, Inc., 1550 Powell Street, Emeryville, California
The Philip Carey Mfg. Co., 1935 Easton Blvd., Lockland, Cincinnati 15, Ohio
Raybestos-Manhattan, Inc., Passaic, N. J.
The Ruberoid Co., South Bound Brook, New Jersey
Union Asbestos & Rubber Co., 332 South Michigan Ave., Chicago 4, Illinois
H. S. Rubber Co., 1232 Ave. of the Americas, New York, New York
Victor Mfg. & Gasket Co., 5752 W. Roosevelt Rd., Chicago 50, Ill.

BARITE

(Possible Buyers of Crude Barite)

Barium Products, Ltd., P. O. Box 920, Modesto, Calif.
Baroid Sales Division, National Lead Co., P. O. Box 1675, Houston 1, Texas
The Glidden Co., Chemical & Pigment Division 766 50th Ave., Oakland 1, Calif.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Industrial Minerals & Chemical Co., Sixth and Gilman Sts., Berkeley, Calif.
Macco Corp., 14409 S. Paramount Blvd., Paramount, Calif.
Magnet Cove Barium Corp., P. O. Box 6504, Houston 5, Texas
Milwhite Mud Sales Co., Box 15035, Houston 20, Texas
Osark Smelting and Mining Co., Coffeyville, Mo.
Super Bar Co., Mineral Point, Mo.
C. K. Williams & Co., 2001 Lynch Ave., East St. Louis, Ill.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Possible buyers of Crushed or Ground Barite for Use in Glass)

Anchor-Hocking Glass Co., 109 N. Broad St., Lancaster, Ohio
Ball Bros., Ryan and Burt Sts., Muncie, Ind.
Brockway Glass Co., Brockway, Pa.
Buck Glass Co., Fort and Silica Sts., Baltimore, Md.
Commercial Glass Co., Fairmont, W. Va.
Diamond Glass Co., Royersford, Pa.
Foster-Forbes Glass Co., Marion, Ind.
Hazel-Atlas Glass Co., 1942 Danneburg St., Wheeling, W. Va.
Lathford-Marble Glass Co., P. O. Box 4707, Los Angeles, Calif.
Owens-Illinois Glass Co., Duraglas Bldg., Toledo, Ohio
Owens-Illinois Pacific Coast Co., 135 Stockton St., San Francisco, Calif.
Sterling Glass Co., Dapel, Ind.
Thatcher Manufacturing Co., Elmira, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Possible Buyers of Ground Barite for Use in Paint)

Amalgamated Paint Co., Inc., Pier 11, North River, New York, N. Y.
Armstrong Cork Co., 1010 Concord St., Lancaster, Pa.
Atlantic Paint & Varnish Works, Wilmington, N. C.
Baker Paint & Varnish Co., 224 Suydam Ave., Jersey City, N. J.
C. E. Butler Co., 2365 Hanna St., Oakland 8, Calif.
Fisher Thorsen & Co., Inc., 2160 N. W. 22nd Ave., Portland 10, Ore.
W. P. Fuller & Co., 301 Mission St., San Francisco, Calif.

General Paint Corp., 2627 Army St., San Francisco 19, Calif.
U. S. Gypsum Co., 300 W. Adams St., Chicago, Ill.
Weeco Waterpaints, Fifth and Grayson Sts., Berkeley 2, Calif.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.
(Possible Buyers of Crude Barite for Use in Barium Chemicals)
Barium Products Ltd., P. O. Box 920, Modesto, Calif.
Columbia Southern Chemical Corp., One Gateway Center, Pittsburgh 22, Pa.
Barium Reduction Corp., Drawer 1, South Charleston, W. Va.
Chicago Copper & Chemical Co., Blue Island, Ill.
Mallinckrodt Chemical Works, St. Louis, Mo.
Osark Smelting & Mining Co., Coffeyville, Kansas

BENTONITE

(Possible Buyers of Crude and Ground)

Abbott Laboratories, North Chicago, Ill.
American Colloid Co., Merchandise Mart Plaza, Chicago 54, Ill.
Atlantic Refining Co., 260 S. Broad St., Philadelphia, Pa.
Baroid Sales Div., National Lead Co., P. O. Box 1675, Houston 1, Texas
Cities Service Refining Co., Boston, Mass.
Commercial Minerals Co., San Francisco, Calif.
Charles B. Crystal Co., Inc., 53 Park Place, New York, N. Y.
Eastern Clay Products, Inc., 223½ Main St., Jackson, Ohio
Filtrol Corp., 634 So. Spring St., Los Angeles 14, Calif.
Great Lakes Foundry Sand Co., 700 United Artists Bldg., Detroit, Mich.
Gulf Refining Co., 260 S. Broad St., Phila., Pa.
Hammill & Gillespie, Inc., 225 Broadway, New York 7, N. Y.
Harshaw Chemical Co., 47 Ann St., New York 7, N. Y.
Pure Oil Co., 35 E. Wacker Dr., Chicago, Ill.
Quaker State Oil Corp., Emlenton, Pa.
Richfield Oil Corp. of New York, Chanin Bldg., New York, N. Y.
United Clay Mines Corp., 109 Oakland St., Trenton, N. J.
Western Clay and Metals Co., 1 So. 2nd St., Alabama, Calif.
Western Clay Products Co., P. O. Box 231, Houston, Texas
Western Talc Co., 1901 E. Slauson Ave., Los Angeles 11, Calif.

BERYL

The Beryllium Corp., P. O. Box 1462, Reading, Pa.
Beryl Ores Co., P. O. Box 409, Route 1, Arvada, Colo.
The Brush Beryllium Co., 4301 Perkins Ave., Cleveland 3, Ohio
Champion Spark Plug Co., Toledo 1, Ohio
Lapp Insulator Co., Inc., LeRoy, N. Y.
A. O. Smith Corp., 3533 N. 27th St., Milwaukee 16, Wisc.
Note: Domestic beryl is also purchased at Government buying depots at Custer, S. Dak., Franklin, N. H., and Spruce Pine, N. C.

BISMUTH

(Metal)

American Metal Climax Inc., 61 Broadway, New York 6, N. Y.
American Smelting and Refining Co., 120 Broadway, New York 5, N. Y.
The Anaconda Co., 25 Broadway, New York 4, N. Y.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
J. T. Baker Chemical Co., Phillipsburg, N. J.
Campagne Aramaya de Mines en Bolivia, 120 Broadway, New York 4, N. Y.
Cerro de Pasco Corp., 300 Park Ave., New York 22, N. Y.
Grace & Co., W. R., Hanover Square, New York 8, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
Mallinckrodt Chemical Works, 2nd & Mallinckrodt Streets, St. Louis 7, Mo.
Merck & Co. Inc., Rahway, N. J.
National Lead Co., 111 Broadway, New York 6, N. Y.
Norwich Pharmacal Co., 17 Eaton Avenue, Norwich, N. Y.
Charles Pfizer & Co., Inc., 11 Bartlett Street, Brooklyn 6, N. Y.
Philipp Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
U. S. Metals Refining Co., 61 Broadway, New York 6, N. Y.
U. S. Smelting Refining & Mining Co., 75 Federal St., Boston 6, Mass.

CADMIUM

American Metal Climax Inc., 61 Broadway, New York 6, N. Y.
American Smelting and Refining Co., 120 Broadway, New York 5, N. Y.
American Zinc, Lead and Smelting Co., 1600 Paul Brown Bldg., St. Louis, Mo.
The Anaconda Co., 25 Broadway, New York, N. Y.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
The Bunker Hill Co., P. O. Box 29, Kellogg, Idaho
Chemical and Pigment Co. (Div. of the Glidden Co.), Baltimore 22, Maryland
Eagle Picher Co., (Mining and Smelting Div.), P. O. Box 910, Miami, Okla.
Grace & Co., W. R., Hanover Square, New York 8, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
International Minerals and Metals Corp., 11 Broadway, New York 4, N. Y.
International Smelting and Refining Co., 818 Kearns Bldg., Salt Lake City, Utah
New Jersey Zinc Co., 160 Front St., New York 38, N. Y.
Philipp Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
Sherwin-Williams Co., Ozark Smelting & Mining Div., 101 Prospect Ave., N.W., Cleveland 1, Ohio.

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(Metallurgical Ore Users)

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Baltimore Works, Armco Steel Corp., 3400 E. Chas. St., Baltimore 13, Md.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R., Hanover Square, New York 8, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
Keokuk Electro-Metals Co., Div. of Vanadium Corp. of America, Keokuk, Iowa
Montana Ferroalloys, Inc., P. O. Box 1400, Memphis, Tenn.
Ohio Ferro-Alloys Corp., 639 30th St. N.W., Canton 9, Ohio
Pacific Northwest Alloys, Inc., P. O. Box 6247, Hillyard Station, Spokane, Wash.
Pittsburgh Metallurgical Co., Niagara Falls, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Tennessee Products & Chemical Corp., 2611 West End Ave., Nashville 5, Tenn.
Union Carbide Metals Co., Div. of Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y.
Vanadium Corporation of America, 420 Lexington Ave., New York 17, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Chemical Ore Users)

Columbia-Southern Chemical Corp., 902 Garfield Ave., Jersey City 5, N. J.
Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio
Diamond Alkali Co.-Kearny Plant, Betteville Turnpike, Kearny, N. J.
Foots Mineral Co., Inc., 10 E. Chelton Ave., Philadelphia 44, Pa.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R., Hanover Square, New York 8, N. Y.
Imperial Color Chemical and Paper Corp., Glens Falls, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
Mutual Chemical Div. Allied Chemical Corp., 99 Park Ave., New York 16, N. Y.
Frank Samuel & Co., Inc., 2 Penn Center Plaza, Philadelphia 2, Pa.
Solvay Process Div., Allied Chemical Corp., P. O. Box 271, Syracuse, N. Y.

(Refractory Ore Users)

Basic Refractories, Inc., 845 Hanna Bldg., Cleveland 15, Ohio
General Refractories Co., 1320 Locust St., Philadelphia 2, Pa.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R., Hanover Square, New York 8, N. Y.
Harbison-Walker Refractories Co., 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.
International Bartering Co., 52 Broadway, New York 4, N. Y.
Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland 12, Calif.
E. J. Lavino & Co., 3 Penn Center Plaza, Philadelphia 2, Pa.
Refractories Div., H. K. Porter Co., Inc., Pascagoula, Miss.
Frank Samuel & Co., Inc., Philadelphia 2, Pa.
U. S. Steel Corp., 625 William Penn Place, Pittsburgh 30, Pa.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

COBALT

Allied Chemical & Dye Corp., General Chemical Div., Marcus Hook, Pa.
Baker Chemical Co., J. T., Phillipsburg, N. J.
Carlisle Chemical Works, Inc., Reading, Ohio
Carlisle Chemical Works, Inc., Advance Solvents & Chemical Div., New Brunswick, N. J.
Ceramic Color & Chemical Mfg. Co., New Brighton, Pa.
Harshaw Chemical Co., 1945 East 9th St., Cleveland 6, Ohio.
International Bartering Co., 52 Broadway, New York 4, N. Y.
Kennametal, Inc., Latrobe, Pa.
Mallinckrodt Chemical Works, St. Louis, Mo.
Mooney Chemicals, Inc., Cleveland, Ohio

COLUMBITE-TANTALITE

African Metals Corp., 25 Broad St., New York 4, N. Y.
J. E. De Souza Co., Inc., 217 Broadway, New York 7, N. Y.
Derby & Co., 10 Cedar St., New York 5, N. Y.
Fansteel Metallurgical Corp., N. Chicago, Ill.
Foots Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
E. A. Godoy & Co., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R., Hanover Square, New York 8, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
Kennametal, Inc., Latrobe, Pa.
Mallinckrodt Chemical Works, 2nd & Mallinckrodt St., St. Louis 7, Mo.
Metal Hydrides Inc., 12-24 Congress St., Beverly, Mass.
Standard Ore & Alloys Corp., 120 Wall St., New York 5, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Union Carbide Metals Co., Division of Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y.
Wah Chang Corp., Woolworth Bldg., New York 7, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

COPPER

American Metal Climax Inc., Carteret, N. J.
American Smelting & Refining Co., El Paso, Tex., Hayden, Ariz., Tacoma, Wash.
The Anaconda Co., Anaconda, Mont.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R., Hanover Square, New York 8, N. Y.
Inspiration Consolidated Copper Co., Inspiration, Ariz.
International Minerals & Metals Corp., 11 Broadway, New York 6, N. Y.
International Smelting & Refining Co., Miami, Ariz.
Magma Copper Co., Superior, Ariz.
Phelps Dodge Refining Corp., Laurel Hill, N. Y.
Phelps Dodge Corp., Douglas, Ariz., Morenci, Ariz., Ajo, Ariz.
Philipp Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Tennessee Copper Co., Copperhill, Tenn.

DIATOMITE

Industrial Minerals & Chemical Co., 836-838 Gilman Street, Berkeley, Calif.
National Filter Media Co., Sales Division of Filter Media Corp., 1719 Dixwell Avenue, New Haven, Conn.
Filpaco Industries, Inc., 2422 South Michigan Ave., Chicago, Ill.
Kraft Chemical Company, 919 West 18 Street, Chicago, Ill.
Minerals & Insulation Co., Inc., 55 Central Avenue, Rochelle Park, N. J.

Johns-Manville Corp., 22 East 40th Street, New York, N. Y.
 L. A. Salomon & Brother, 218 Pearl Street, New York, N. Y.
 Pomeroy & Fischer Inc., 95 Madison Avenue, New York, N. Y.
 West Virginia Pulp & Paper Co., 230 Park Avenue, New York, N. Y.
 Whittaker Clark & Daniels Inc., 260 West Broadway, New York, N. Y.

FELDSPAR

(Possible Buyers of Crude, Crushed, or Ground)

Akron Porcelain Co., Kenmore Station, Akron, Ohio
 Ball Brothers Co., Muncie, Ind.
 Corning Glass Works Co., 1943 Crystal St., Corning, N. Y.
 Donnelly-Kelley Glass Co., 49 Fenlon St., Holland, Mich.
 General Ceramics Co., 30 Rockefeller Plaza, New York, N. Y.
 Hazel-Atlas Glass Co., 1942 Dannelberg St., Wheeling, W. Va.
 Knox Porcelain Corp., 150 Mynders St., Knoxville, Tenn.
 Owens-Illinois Glass Co., Toledo, Ohio
 Owens-Pacific Coast Co., 15 H & Folsome Sts., San Francisco, Calif.
 Porcelain Products Co., Inc., 1941 Broadway, Parkersburg, W. Va.
 Star Porcelain Co., Muirhead & Dewey Ave., Trenton, N. J.
 Trenton Pottery Co., Inc., Trenton, N. J.
 Wellsville China Co., Wellsville, Ohio

FLUORSPAR

(Brokers or Selling Agents)

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 Balfour, Guthrie & Co., Los Angeles, Calif.
 Continental Ore Co., 500 Fifth Ave., New York City.
 E. I. du Pont de Nemours & Co., 1007 Market St., Wilmington, Del.
 Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Grace & Co., W. R. Hanover Square, New York City, N. Y.
 Kerchner, Marshall & Co., Oliver Bldg., Pittsburgh, Pa.
 E. J. Lavino & Co., 1528 Walnut St., Philadelphia, Pa.
 Mercantile Import & Export Corp., 21 East 40th St., New York City.
 Mercantile Metal & Ore Corp., 60 Wall St., New York City.
 Oglebay Norton & Co., Hanna Bldg., Cleveland, O.
 Philipp Brothers Ore Corp., 70 Pine Street, New York 5, N. Y.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

GERMANIUM

American Metal Climax, Inc., 61 Broadway, New York 6, N. Y.
 American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
 American Zinc, Lead and Smelting Co., 518 Olive St., St. Louis, Mo.
 Eagle Picher Co., Mining and Smelting Div., First Nat. Bank Bldg., Miami, Ohio.
 Grace & Co., W. R. Hanover Square, New York 8, N. Y.
 Sylvania Electric Products, Inc., Towanda, Pa.

GRAPHITE

The Asbury Graphite Mills, Inc., 41 Main St., Asbury, N. J.
 Cummings-Moore Graphite Co., 1646 Green Ave., Detroit 9, Mich.
 Joseph Dixon Crucible Co., 167 Wayne St., Jersey City 3, N. J.
 Grace & Co., W. R. Hanover Square, New York 8, N. Y.
 Charles Pettinone, Inc., 1 E. 42nd St., New York 17, N. Y.
 Superior Graphite Co., 33 S. Clark St., Chicago 3, Ill.
 United States Graphite Co., 1621 Holland Ave., Saginaw, Mich.

IRON ORE

Acme Steel Co., Newport, Kentucky.
 Alan Wood Steel Co., Conshohocken, Pa.
 Bethlehem Steel Company, Bethlehem, Pa.
 Columbia-Geneva Steel Div., U. S. Steel Corp., 120 Montgomery, San Francisco, Calif.
 Colorado Fuel & Iron Corp., Pueblo, Colorado.
 Crucible Steel Co. of America, P. O. Box 88, Pittsburgh 30, Pa.
 Detroit Steel Corp., Portsmouth, Ohio.
 Ford Motor Co., 3000 Schaefer Road, Dearborn, Mich.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Grace & Co., W. R. Hanover Square, New York 8, N. Y.
 Granite City Steel Co., Box 367, Granite City, Ill.
 Hanna Furnace Corp., Grant Bldg., Pittsburgh, Pa.
 Inland Steel Co., 3210 Watling St., E. Chicago, Indiana.
 Interlake Iron Corp., 1900 Union Commerce Bldg., Cleveland 14, Ohio.
 International Harvester Co., 180 No. Michigan Ave., Chicago 1, Ill.
 Jones & Laughlin Steel Corp., 401 Liberty Ave., Gateway Center, Pittsburgh 30, Pa.
 Kaiser Steel Corp., P. O. Box 217, Fontana, Calif.
 Lone Star Steel Co., P. O. Box 8087, Dallas 5, Tex.
 National Steel Corp., Grant Bldg., Pittsburgh, Pa.
 Pittsburgh Steel Co., Grant Bldg., Pittsburgh, Pa.
 Republic Steel Corp., Republic Bldg., 25 Prospect Ave., N. W. Cleveland 1, Ohio.
 Sharon Steel Corp., Sharon, Pa.
 Shenango Furnace Co., Oliver Bldg., Pittsburgh, Pa.
 Tennessee Coal & Iron Div., U. S. Steel Corp., P. O. Box 599, Fairfield, Ala.
 U. S. Pipe & Foundry Co., Birmingham, Ala.
 U. S. Steel Corp., 525 Wm. Penn Plaza, Pittsburgh 30, Pa.
 Wheeling Steel Corp., Wheeling, West Virginia.
 Woodward Iron Company, Woodward, Ala.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.
 Youngstown Sheet & Tube Co., Stambaugh Bldg., Youngstown 1, Ohio.

LEAD

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 American Metal Climax, Inc., 61 Broadway, New York 6, N. Y.
 American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
 The Bunker Hill Co., Kellogg, Idaho.
 Combined Metals Reduction Co., Felt Bldg., Salt Lake City, Utah.
 The Consolidated Mining & Smelting Co., Ltd., Montreal, Canada.
 Eagle Picher Co., Mining and Smelting Div., P. O. Box 910, Miami, Oklahoma.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Grace & Co., W. R. Hanover Square, New York 8, N. Y.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 International Smelting & Refining Co., 25 Broadway, New York 4, N. Y.
 Metal Traders, Inc., 67 Wall St., New York, N. Y.
 National Lead Company, 111 Broadway, New York, N. Y.
 Philipp Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
 St. Joseph Lead Co., 250 Park Ave., New York 17, N. Y.
 C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.

United States Smelting Refining & Mining Co., 75 Federal St., Boston, Mass.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

LEPIDOLITE

American Potash & Chemical Corp., 2020 W. 6th St., Los Angeles 54, Calif.
 Corning Glass Works, Corning, N. Y.
 J. E. De Souza Co., Inc., 217 Broadway, New York 7, N. Y.
 General Electric Co., Nela Park, Cleveland, Ohio.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Grace & Co., W. R. Hanover Square, New York 8, N. Y.
 Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
 Pittsburgh Corning Corp., Port Allegany, Pa.

MAGNESITE AND BRUCITE

Basic, Inc., 845 Hanna Bldg., Cleveland 15, Ohio.
 Corhart Refractories Co., (Corning Glass Works), 1662 West Lee St., Louisville, Ky.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland, Calif.
 Northwest Magnesite Co., 1900 Farmers Bank Bldg., Pittsburgh 22, Pa.
 Pabco Products Inc., 1550 Powell St., Emeryville 8, Calif.
 Philipp Brothers Ore Corp., 70 Pine Street, New York 5, N. Y.
 Standard Slag Co., 1200 Wick Bldg., Youngstown 1, Ohio.
 Westvaco Chemical Division, Food Machinery & Chemical Corp., 161 E. 47nd St., New York, N. Y.

MANGANESE ORE

(Metallurgical-grade)

Associated Metal & Minerals Corp., 75 West St., New York 6, N. Y.
 Bethlehem Steel Co., Bethlehem, Pa.
 Colorado Fuel and Iron Corp., Pueblo, Colorado.
 Electro Manganese Div., Foote Mineral Co., Knoxville, Tenn.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Grace & Co., W. R. Hanover Square, New York City, N. Y.
 Keokuk Electro Metals Co., Keokuk, Iowa.
 National Paint and Manganese Co., Lynchburg, Virginia.
 C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
 Tennessee Products and Chemical Corp., American National Bank Bldg., Nashville Tennessee.
 Tenn-Tex Alloy and Chemical Corp., 500 First American National Bank Bldg., Nashville 3, Tenn.
 Union Carbide Metals Co., 30 E. 42nd St., New York 17, N. Y.
 United States Steel Co., 525 William Penn Place, Pittsburgh 30, Pa.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Battery and Chemical-grade)

Acme Battery Corp., 200 Henry St., Stamford, Conn.
 Burgess Battery Company, Freeport, Ill.
 Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
 General Electric Co., Nela Park, Cleveland, Ohio.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Grace & Co., W. R. Hanover Square, New York City, N. Y.
 E. J. Lavino & Co., 3 Penn Center Plaza, Philadelphia 2, Pa.
 Mallory Battery Co., Div. of P. R. Mallory & Co., Inc., 13000 Athens Ave., Cleveland, Ohio.
 National Carbon Co., P. O. Box 6087, Cleveland, Ohio.
 Olin Mathieson Chemical Corp., 225 Winchester Ave., New Haven 4, Conn.
 Ray-O-Vac Div., Electric Storage Battery Co., 212 E. Washington Ave., Madison, Wis.
 Tennessee Eastman Corp., Kingsport, Tenn.

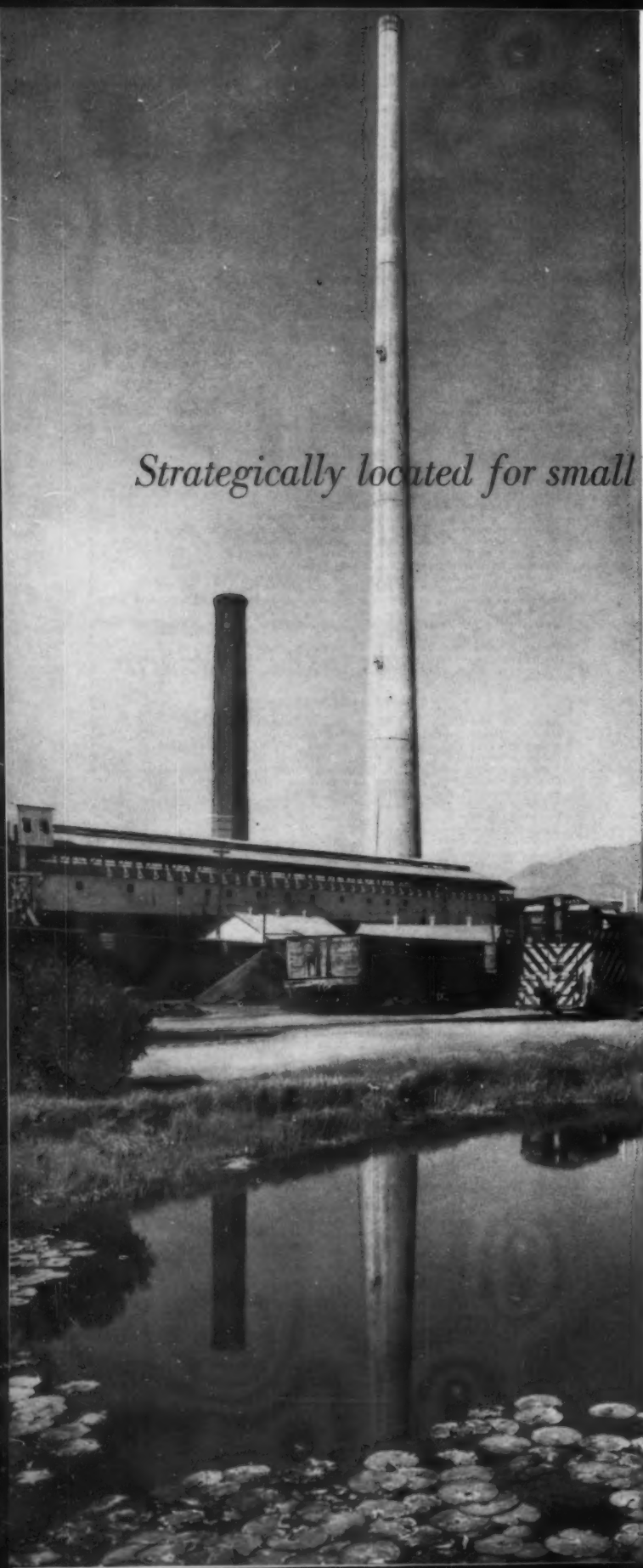
MERCURY

Allied Chemical Corp., The Solvay Process Div., P. O. Box 271, Syracuse, N. Y.
 American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.
 American Meter Co., Erie, Pa.
 Automatic Steel Products, Inc., Mercury Clutch Div., 1201 Camden Ave., S. W., Canton 6, Ohio.
 Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 Bailey Meter Co., 1052 Ivanhoe Rd., Cleveland 10, Ohio.
 J. T. Baker Chemical Co., Phillipsburg, N. J.
 F. W. Berk & Co., Inc., Woodbridge Div., Box 38, Woodbridge, N. J.
 Eastman Chemical Div., 25 Brannon St., San Francisco, Cal.
 E. I. du Pont de Nemours & Co., Inc., Methods Div., Du Pont Bldg., Wilmington 98, Del.
 General Aniline & Film Corp., General Aniline Works Div., 435 Hudson St., New York 14, N. Y.
 General Color Co., 24 Avenue B, Newark 5, N. J.
 General Electric Co., Purchasing Dept., 1 River Road, Schenectady 5, N. Y.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Grace & Co., W. R. Hanover Square, New York 8, N. Y.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 International Minerals & Metals Corp., 11 Broadway, New York 6, N. Y.
 Mallinckrodt Chemical Works, Jersey City 5, N. J.
 Mathieson Chemical Co., Baltimore, Md.
 Merck & Co., Inc., Lincoln Ave., Rahway, N. J.
 The Mercold Corp., 4201 Belmont Ave., Chicago 41, Ill.
 Metalalite Corp., 200 Wacker Rd., Hawthorne, N. J.
 Minneapolis Honeywell Regulator Co., Micro Switch Div., Freeport, Ill.
 Brown Instrument Div., 4331 Wayne Ave., Philadelphia, Pa.
 Philipp Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
 Phillips Petroleum Co., Bartlesville, Okla.
 Quicksilver Products Inc., 407 Sansome St., San Francisco 11, Calif.
 Thomas A. Edison, Inc., Primary Battery Div., Bloomfield, N. J.
 Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, N. J.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.
 Wyandotte Chemical Corp., Wyandotte, Mich.

MICA

(Buyers of Muscovite Block, Film Mica, and Phlogopite Block Mica)

Aerovox Division, Aerovox Corp., 740 Belleville Ave., New Bedford, Mass.
 American Mica Insulation Co., 235 Parker Ave., Manassquan, N. J.
 Ashville Mica Co., P. O. Box 318, Newport News, Va.
 Carpenter & Phillips, Box 657, Spruce Pine, N. C.



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Corpus Christi, Texas
Rosita, Coah., Mexico

COPPER SMELTERS

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El Paso, Texas
Tacoma, Washington
San Luis Potosi, S.L.P., Mexico

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American Smelting and
Refining Company,
Ore Purchasing Department,
120 Broadway,
New York 5, N. Y.

58-54

ASARCO

Diamond Power Specialty Corp., P. O. Box 415, Lancaster, Ohio.
Farnam Mfg., Inc., Sweeten Creek Road, Asheville, N. C.
General Electric Co., 1 River Road, Schenectady, N. Y.
Mica Fabricating Company, 53 Central Ave., Rochelle Park, N. J.
Micrafract Products, Inc., 181 McArthur Highway, Newark 5, N. J.
Reliance Mica Co., 341 39th St., Brooklyn, N. Y.
Spruce Pine Mica Co. and Mayland Mfg. Co., Spruce Pine, N. C.
The Tar Heel Mica Co., Inc., Plumtree, N. C.
Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

(Consumers of Mica Splittings)

American Electrical Heater Co., 6110 Cass Ave., Detroit, Michigan.
Cleveland Mica Co., 1360 Hird St., Lakewood, Ohio.
Continental-Diamond Fibre Co., Valparaiso, Indiana.
General Electric Co., 1 River Road, Schenectady, N. Y.
Mica Insulator Company, 757 Broadway, Schenectady, New York.
National Electric Coil Co., Columbus, Ohio.
Westinghouse Electric Corp., P.O. Box 472, Irwin, Pa.

MICA GRINDERS

(Buyers of Domestic Scrap Mica)

Concord Mica Corp., 25 Crescent St., Penacook, N. H.—Wet.
International Minerals & Chemical Corp., Old Orchard Road, Skokie, Ill., plants at Erwin, Tenn. and Pueblo, Colo.
Deneen Mica Co., Burnsville, N. C.—Dry.
Diamond Mica Co., 79 Prospect St., Stamford, Conn.
English Mica Co., Spruce Pine, N. C.—Wet and Dry.
Franklin Mineral Products Co., Box 38, Franklin, N. C.—Wet and Dry.
The Funkhouser Co., Hartwell, Georgia—Dry.
Imperial Milling Co., 2738 Merced Ave., El Monte, Calif.
Kings Mountain Mica Co., Inc., Box 709, Kings Mountain, N. C.—Dry.
Southern Mica Co., Johnson City, Tenn.—Dry.

MOLYBDENUM CONCENTRATES

J. T. Baker Chemical Co., Phillipsburg, N. J.
Climax Molybdenum Co., Div. American Metal Climax, Inc., 500 Fifth Ave., New York, N. Y.
Crucible Steel Co. of America, Pittsburgh, Pa.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
International Minerals & Metals Corp., 11 Broadway, New York 5, N. Y.
Molybdenum Corp. of America, 375 Park Ave., New York, N. Y.
Republic Steel Corp., Canton, Ohio.
S. W. Shattuck Chemical Co., Denver, Colo.
Union Carbide Metals Co., Niagara Falls, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

PERLITE

(Producers of Expanded Perlite)

Airlite Processing Corp., Bldg. 9, Air Base, Vero Beach, Fla.
American Bldgk Co., 2091 W. Pershing Road, Chicago 9, Ill.
Alatex Construction Service, Inc., 3518 Broadway St., New Orleans 18, La.
Buffalo Perlite Corp., 100 Sugg Road (Cheektowaga), Buffalo 21, N. Y.
Florida Perlite Co., 285 West 9th St., Hialeah, Fla.
Great Lakes Carbon Corp., 612 Flower St., Los Angeles 17, Calif.
Gregg Products Co., 616 Chestnut St., S. W. Grand Rapids, Mich.
McClure & Erickson Corp., 2416 Bedouan Ave., Los Angeles 22, Calif.
Midwest Perlite Products, Inc., 1120 Railroad St., W. Des Moines, Iowa.
Minerals Processing Corp., 520 Van Rensselaer St., Syracuse, N. Y.
Minnesota Perlite Corp., 315 W. 56th St., Minneapolis 20, Minn.
National Gypsum Co., 325 Delaware Ave., Buffalo 2, N. Y.
Panacalite Pacific, Inc., 545 E. 60th St., Los Angeles 1, Calif.
Paramount Perlite Co., 16236 S. Illinois St., Paramount, Calif.
Supreme Perlite Co., P.O. Box 66, North Portland, Oregon.
Silbrico Corp., 5901 W. 66th St., Chicago 36, Ill.

PLATINUM

J. Bishop & Co. Platinum Works, Malvern, Pa.
Engelhard Industries, Inc., 113 Astor Street, Newark 5, N. J.
Goldsmith Bros. Division of National Lead Co., 1360 W. 59th St. Chicago 36, Illinois
Handy & Harman, 82 Fulton Street, New York 38, N. Y.
Johnson, Matthey & Co., Inc., 608 Fifth Avenue, New York 20, N. Y.
Kastenhuber & Lehrfeld, Inc., 21 West 46th St., New York 36, N. Y.
Mercantile Metal & Ore Corp., 595 Madison Avenue, New York 22, N. Y.
J. A. Samuel & Co., Inc., 165 Broadway, New York 6, N. Y.
Sigmund Cohn Corp., 121 S. Columbus Avenue, Mt. Vernon, N. Y.

PYRITE

American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
The Anaconda Co., 25 Broadway, New York 4, N. Y.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Baugh Chemical Company, Baltimore, Maryland.
Davidson Chemical Corporation, 26 Hopkins Place, Baltimore 3, Maryland.
Foote Mineral Company, 18 West Chelten Ave., Philadelphia 44, Pa.
General Chemical Division, Allied Chemical & Dye Corp., P. O. Box 4046, Denver, Colorado.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Phillips Brothers Ore Corp., 70 Pine Street, New York 5, N. Y.
Stauffer Chemical Company, 636 California St., San Francisco 8, Calif.
C. Tennant, Sons & Co., 180 Park Ave., New York 17, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

RARE-EARTH ORES

(Cerium ores, monazite sand, bastnaesite, other)

Davidson Chemical Division, W. R. Grace & Company, Pompton Plains, New Jersey
Lindsey Chemical Division, American Potash and Chemical Corp., West Chicago, Ill.
Lunex Company, Pleasant Valley, Iowa
Maywood Chemical Works, Maywood, New Jersey
Michigan Chemical Company, Saint Louis, Michigan
Molybdenum Corporation of America, Pittsburgh, Pennsylvania
Research Chemicals Incorporated, Burbank, California
St. Eloi Corporation, Newtown Station, Cincinnati, Ohio
Mallinckrodt Chemical Works, St. Louis, Missouri
Vitro Chemical Company, Chattanooga, Tennessee

SELENIUM

Allied Chemical Corp., 40 Rector St., New York 6, N. Y.

American Metal Climax, Inc., 61 Broadway, New York 6, N. Y.
American Smelting & Refining Co., 120 Broadway, New York 4, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
International Smelting & Refining Co., 25 Broadway, New York, N. Y.
Kennecott Sales Corp., 161 East 42nd St., New York 17, N. Y.

SILICA

(Possible Buyers Exclusive of Glass Manufacturers)

Commercial Minerals Co., 319 Irwin St., San Francisco
Great Lakes Foundry Sand Co., 720 United Artist Bldg., Detroit 26, Mich.
Industrial Minerals and Chemical Co., 836 Gilman, Berkeley, Calif.
Industrial Silica Corp., Stambaugh Bldg., Youngstown, Ohio
Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland, Calif.
Linde Air Products Co., 39 East 42nd St., New York, N. Y.
Minerals and Insulation Corp., 45 Central Ave., Rochelle Park, New Jersey

SPODUMENE

Corning Glass Works, Corning, N. Y.
J. E. De Sousa Co., Inc., 217 Broadway, New York 7, Pa.
Foote Mineral Co., 18 E. Chelten Ave., Philadelphia 44, Pa.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
Lithium Corp. of America, Inc., Rand Tower, Minneapolis 2, Minn.
Maywood Chemical Works, Maywood, N. J.
National Enameling and Stamping Co., 270 N. 12th St., Milwaukee, Wis.
Owens Corning Fiberglas Corp., Newark, Ohio.
Phillips Brothers Ore Corp., 70 Pine Street, New York 5, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.

STRONTIUM ORES

Associated Metals & Minerals Corp., 40 Rector St., New York, N. Y.
J. T. Baker Chemical Co., Phillipsburg, N. J.
Barium Products, Ltd., Modesto, Calif.
Barium Reduction Corp., Charleston, W. Va.
Continental Ore Corp., 500 Fifth Ave., New York, N. Y.
E. I. du Pont de Nemours & Co., Inc., 11th & Orange Sts., Wilmington, Del.
Foote Mineral Co., Inc., 12 E. Chelten Ave., Philadelphia, Pa. (minerals).
General Electric Co., 1 River Road, Schenectady, N. Y.
Chas. Hardy, 415 Lexington Ave., New York, N. Y.
Harshaw Chemical Co., 1935 E. 7th St., Cleveland, Ohio.
Oglebay Norton & Co., Hanna Bldg., Cleveland, Ohio

TALC

(Producers and Grinders of Crude Talc, Pyrophyllite and Soapstone)

Alberene Stone Corp. of Va., Schuyler, Va.
Blue Ridge Talc Co., Inc., Henry, Va.
Carolina Pyrophyllite Co., Staley, N. C.
Commercial Minerals Co., 319 Irwin St., San Francisco, Calif.
Eslera Magnesia Talc Co., Inc., 206 Bank St., Burlington, Vt.
Glendon Pyrophyllite Co., Staley, N. C.
Gouverneur Talc Co., Inc., Gouverneur, N. Y.
Huntley Industrial Minerals, Inc., Box 305 Bishop, Calif.
Industrial Minerals & Chemical Co., 6th & Gilman St., Berkeley, Calif.
Southern Talc Co., Chatsworth, Ga.
Southwestern Talc Corp., Llano, Texas.
Stauffer Chemical Co., P. O. Box 68, N. Portland, Ore.

TANTALITE (SEE COLUMBITE) TIN

American Smelting and Refining Co., 120 Broadway, New York 5, N. Y.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Vulcan Detinning Div., Vulcan Materials Co., Sewaren, N. J.
Wah Chang Corp., Woolworth Bldg., New York 7, N. Y.

TITANIUM MINERALS

(Titanium Metal Manufacturers—Ilmenite and Rutile)

E. I. du Pont de Nemours and Co., Inc., DuPont Bldg., Wilmington 98, Del.
Mallory-Sharon Metals Corp., Warren Avenue, Niles, Ohio
Union Carbide Metals Co., Div. of Union Carbide and Carbon Corp., Ashabula, Ohio and 40 East 42nd St., New York 7, New York
Titanium Metals Corp. of America, 233 Broadway, New York, N. Y.

(Pigment Manufacturers—Ilmenite)

American Cyanamid Co., Pigments Div., 30 Rockefeller Plaza, New York 20, N. Y.
E. I. du Pont de Nemours and Co., Inc., DuPont Bldg., Wilmington 98, Del.
The Glidden Co., Chemicals-Pigments-Metals Div., 900 Union Commerce Bldg., Cleveland 14, Ohio
National Lead Co., 111 Broadway, New York 6, N. Y.
New Jersey Zinc Co., Gloucester City, N. J.

(Welding Rod Manufacturers—Ilmenite and Rutile)

American Brake Shoe Co., 230 Park Ave., New York 17, N. Y.
Stoody Co., Slauson Ave. at Sorenson, Whittier, Calif.
Westinghouse Electric Corp., Box 2278, Pittsburgh 30, Pa.

(Alloy Manufacturers—Ilmenite and Rutile)

Aluminum Co. of America, 1501 Alcoa Bldg., Washington 6, D. C.
Titanium Alloy Manufacturing Co., Div. of National Lead Co., Box C, Bridge Station, Niagara Falls, N. Y.
Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Vanadium Corp. of America, 420 Lexington Ave., New York 17, N. Y.

(Dealers—Ilmenite)

J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Metallurg, Inc., 99 Park Ave., New York 16, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York, N. Y.

(Dealers—Rutile)

Berkshire Chemicals, Inc., 420 Lexington Ave., New York 17, N. Y.
Foote Minerals Co., Inc., 18 W. Chelten Ave., Philadelphia 44, Pa.
Metallurg, Inc., 99 Park Ave., New York 16, N. Y.
International Titanium Corp., 100 Park Ave., New York 17, N. Y.
Metal Traders, Inc., 67 Wall St., New York 5, N. Y.

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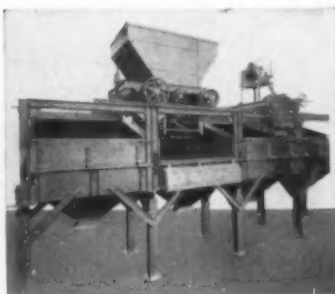
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Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Continental Ore Corp., 509 Fifth Ave., New York 36, N. Y.
J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
Derby & Co., 10 Cedar St., New York 5, N. Y.
Fansteel Metallurgical Corp., 2200 Sheridan Road, North Chicago, Ill.
Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
General Electric Co., Cleveland Wire Works, Lamp Dept., 1331 Char-
don Road, Euclid 17, Ohio.
E. A. Godey & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co. W. E., Hanover Square, New York City, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
Jones & Laughlin, Stainless Steel Dept., Box 4606, Detroit 34, Mich.
Kennametal, Inc., Latrobe, Pa.
Latrobe Steel Co., Latrobe, Pa.
Metallurg, Inc., 99 Park Ave., New York, N. Y.
Molybdenum Corp. of America, 375 Park Ave., New York, N. Y.
North Metal & Chemical Corp., York, Pa.
Reading Chemicals, Box 2115, Wyomissing, Pa.
Salt Lake Tungsten Co., 2160 Indiana Ave., Salt Lake City, Utah
Simonds Saw and Steel Co., Lockport, N. Y.
Sylvania Electric Products Co., Tungsten & Chemical Division, Box 70,
Towanda, Pa.
South American Mineral & Merchandise Corp., 445 Park Ave., New
York 22, N. Y.
C. Tennant Sons & Co., 100 Park Ave., New York, N. Y.
Union Carbide Nuclear Co., 30 E. 42nd St., New York, N. Y.; Bishop,
Calif.
Universal Cycles Steel Corp., Bridgeville, Pa.
Vanadium Alloy Steel Co., Latrobe, Pa.
Vulcan Kidd Steel Div., H. K. Porter Co., Aliquippa, Pa.
Wah Chang Corporation, Woolworth Building, New York 7, N. Y.
Wells Manufacturing, 7800 North Austin Ave., Skokie, Ill.
Westinghouse Electric Corp., 1-17 MacArthur Ave., Bloomfield, N. J.

URANIUM ORES

Mills in Operation

Anaconda Company, Bluewater, (Grants) New Mexico
Climax Uranium Co., Grand Junction, Colo.
Cottier Corporation, Canon City, Colorado
Dawn Mining Co., Ford, Stevens County, Washington
Freemont Minerals Inc., Riverton, Wyo.
Gunnison Mining Co., Gunnison, Colo.
Homestake-New Mexico Partners, Grants, N. Mex.
Homestake-Sapin Partners, Grants, N. M.
Kermac Nuclear Fuels Corp., Grants, N. M.
Kerr McGee Oil Industries, Inc., Shiprock, N. Mex.
Lakeview Mining Co., Lakeview, Ore.
Lucky Mc, Riverton, Wyoming
Mines Development, Inc., Edgemont, S. Dak.
Phillips Petroleum Co., Grants, N. M.
Rare Metals Corp. of America, Tuba City, Ariz.
Texas Zinc Minerals Co., Mexican Hat, Utah
Trace Elements Corp., Maybell, Colo.
Union Carbide Nuclear Co., Rifle, Slickrock, and Uravan, Colo.; Green-
river, Utah
Uranium Reduction Co., Moab, Utah
Vanadium Corp. of America, Durango, Colo.
Vitro Chemical Co., Salt Lake City, Utah
Western Nuclear Corp., Split Rock, Wyoming

ZINC

The American Metal Co., Climax, Inc., 61 Broadway, New York 6, N. Y.
American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
American Zinc Co. of Illinois, 1600 Paul Brown Bldg., St. Louis, Mo.
The Anaconda Co., 25 Broadway, New York 4, N. Y.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
The Athletic Mining and Smelting Co., Ft. Smith, Ark.
The Bunker Hill Co., P. O. Box 29, Kellogg, Idaho.
Combined Metals Reduction Co., Felt Bldg., Salt Lake City, Utah.
E. I. du Pont de Nemours & Co., 1007 Market St., Wilmington 98, Del.
Eagle-Picher Co., Mining & Smelting Div., Miami, Okla.
E. A. Godey & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co. W. E., Hanover Square, New York 5, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
International Minerals & Metals Corp., 11 Broadway, New York 4, N. Y.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
Metal Traders, Inc., 26 Wall St., New York, N. Y.
New Jersey Zinc Co., 160 Front St., New York 7, N. Y.
Philipp Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
St. Joseph Lead Co., 250 Park Ave., New York 17, N. Y.
The Sherwin-Williams Co., Ozark Smelting & Mining Division, 101
Prospect Ave., N.W., Cleveland 1, Ohio.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
U. S. Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia 3, Pa.

ZIRCON

Associated Metals and Minerals Corp., 75 West St., New York 6, N. Y.
Berkshire Chemicals, Inc., 630 3rd Ave., New York 17, N. Y.
Carborundum Metals Company, P. O. Box 32, Akron, N. Y.
Continental Mineral Processing Corp., P. O. Box 8-T, Sharonville, Ohio
Continental Ore Corp., 509 Fifth Ave., New York, N. Y.
Corhart Refractories Company, 1600 W. Lee Street, Louisville 10, Ky.
Feote Mineral Company, 15 W. Chelton Ave., Philadelphia 44, Penn.
Lava Crucible Refractories Company, First National Bank Building,
Pittsburgh, Penn.
Metal & Thermit Corp., 100 Park Ave., New York 17, N. Y.
Metal Traders, Inc., 26 Broadway, New York 5, N. Y.
Metallurg, Inc., 99 Park Avenue, New York 17, N. Y.
Norton Company, New Bond Street, Worcester, Mass.
Orefraction, Inc., Andrews, South Carolina
Pacific Graphite Company, Inc., 40th & Linden Streets, Oakland, Calif.
Philipp Brothers Ore Corp., 70 Pine Street, New York 5, N. Y.
F. Samuel Company, Inc., 1171 Lincoln Library Building, Philadelphia,
Penn.
C. Taylor Sons, Company, 715 Burns St., P. O. Box 58, Cincinnati 14, O.
Titanium Alloy Mfg. Div., 111 Broadway, New York 6, N. Y.
Union Carbide Metals Corp., 30 E. 42nd St., New York 17, N. Y.
Wah Chang Corp., 233 Broadway, New York 7, N. Y.

1960 Directory of Major United States Mining Operations



ABBREVIATION CODE USED IN THIS DIRECTORY ONLY

Accountant	acct
Assistant	asst
Brothers	bros
Chairman	chmn
Chemical	chem
Chief	ch
Company	co
Concentrator	concn
Consolidated	consol
Corporation	corp
Creek	cr
Development	devel
Director	dir
District	dist
Division	div
East	E
Electrical	elec
Engineer	eng
Flotation	flot
Foreman	frn
General manager	gen mgr
Geologist	geol
Gravity	grav
Heavy media	heavy-med
Hydraulic	hydraul
Incorporated	inc
Limited	ltd
Manager	mgr
Mechanical	mech
Metallurgist	met
Mile(s)	mi
Milling	mlg
Mining	mng
North	N
Operations	oper
Operator	op
Owner	own
Partner	part
President	pres
Production	prod
Purchasing agent	purh agt
Secretary	sec
South	S
Superintendent	supt
Surveyor	surv
Treasurer	treas
Underground	undergr
Vice president	VP
West	W
Yearly	yrly

A CAREFUL SURVEY OF SOME 4,200 MINING and allied processing operations, both active and dormant, was the basis of this list of United States mining operations. While MINING WORLD cannot guarantee 100 percent accuracy for this directory, it believes that the list is the best such reference available to the mining industry from any single source.

FOR THE GREATEST POSSIBLE UTILITY operations are listed alphabetically by state. Listings are carried under the name of the operating company, owner, mine, or individual operator, according to the wishes of the parties concerned. In cases where properties are commonly known by more than one name, cross references were used where possible. Major companies have more than one listing. Properties and key personnel are listed by states in which the mines and/or processing plants are located. There is a cross reference to company executive headquarters and to all other states in which the company operates.

QUESTIONNAIRE FORMS covering major operating details and personnel were mailed over a period of six months. Where information supplied by the operator or owner was not complete, supplementary data was obtained from field reports compiled by staff members, records furnished by the MINING WORLD news bureau, and information from federal and state mining agencies, the United States Atomic Energy Commission, many state geologic departments, state conservation commissions, and state and regional mining associations. Special thanks are extended to the U. S. Bureau of Mines and its regional engineers for help in checking operating properties.

THE PROPERTIES WERE ALL ACTIVE and producing when surveyed, except where "under development" and "idle" have been added. It should be noted especially that there are large and important mines listed in the "idle" class in this directory. This is a temporary situation due to low metal prices. Most of these properties are being kept in good physical repair, water is being pumped from the mines, and they can be placed back in operation within a very short time when management gives the go ahead sign. Totally inactive properties with no indication of future resumption of operation were deleted. Ton-nages listed are for daily production, unless otherwise noted. Minerals and metals are listed in order of importance. Key personnel are listed under the address where they may be reached, and unless otherwise specified mill and smelter addresses are the same as those given for the mines.

A SPECIAL NOTE ABOUT URANIUM COMPANIES. Only those uranium companies that are actually operating, developing and/or reportedly made uranium ore shipments in 1959 are listed in this directory. Although MINING WORLD contacted several hundred more former uranium companies than are listed on the following pages, only those which gave proof of actually being in the process of production, development, or exploration work were included. Mining companies, mine operators, etc., are listed in the state in which ore was actually mined. Headquarters of the company (producing unit) are then listed and address given even though in another state; which is often the case.

IF YOUR MINE WAS NOT LISTED in this year's directory, fill out the form below, tear it out of the book along the dashed line and mail it to MINING WORLD, 500 Howard Street, San Francisco 5, California, and your name will be added to the list receiving questionnaires for next year's directory section.

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ATTENTION: New Mine Operators—Unlisted Mine Operators

LIST YOUR MINE IN THE 1961 MINING YEARBOOK MINE DIRECTORY SECTION

To receive questionnaire for listing your mine complete and mail this form to:

Your Name

Your Address

Your City State

Editor, MINING WORLD
500 Howard Street
San Francisco 5, California

Mining Company

CATALOG, SURVEY & DIRECTORY NUMBER, 1960

ALASKA

AGOFF, HARRY
c/o Prince Cr Mng Co, Flat
PLACER Prince Cr Iditarod
dist, nonfloat, Au

**ALASKA EXPLORATION
& MINING COMPANY**
Box 136, Pullman, Wash
Pres: Frank P Busch
VP: Harvey Moys
Sec-Treas: Raymon Smeltz
HERD CREEK PLACER,
Talkeetna

(Under lease to: Trepie, Blair
Bro and Barney)

**ALASKA METALS MNG
CO**

Box 985, Fairbanks
**STEFOVICH & GOLBERT
PROPERTIES**
LODE MINES, Gilmore Dome,
Fairbanks dist, WO₃
Idls

ALASKA NICKEL CO.
c/o Fred Jenkins, Eagle
LODE MINE, Flume Cr,
Eagle Dist, Au
Under devel

**ALASKA MINES &
MINERALS, INC.**

Red Devil
Pres: Ray Wolfe
VP: Robert F Lyman
Sec-Treas: H R Heard
RED DEVIL MINE, Red Devil,
undergr, Hg
Gen Mgr: Robert F Lyman
Eng: Roger A Markle
Geol: Gordon W Herreid
Prod: 30 tons
DE COURSEY MINE, 20 mi N
of Crooked Cr, Hg
Idls
RED TOP MINE, Marsh Mt,
Aleknagik, Hg
Explor
WILLIS GROUP, 5 mi NW of
Red Devil
Idls

**ALASKA PACIFIC CONS
MNG CO.**

519 Colman Bldg, Seattle,
Wash
Pres: V A Montgomery
VP & Gen Mgr: Wm M Stoll
Sec: Carl W Eikeman
INDEPENDENCE MINE,
25 N of Wasilla, undergr
Idls
100-TON FLOT-AMAL MILL
Idls

ALDER CREEK MNG CO.

Box 1999, Fairbanks
Part: Martin Sather, Jr
FLACER 14 mi N of Fairbanks
Au

ALLUVIAL GOLDS, INC

Coal Creek
Pres: Ernest N Patty
Mgr: Dale F Patty
Dir: Walter Seligman, E D Bull
Mrs. A D McRae
PLACER on Woodchooper Cr,
Circle dist, Yukon riv region
4 ft dredge, Au

ANDERSON, ELLIS
Chandalar, Alaska
PLACER, Yukon River
Chandalar Dist, Tobin Creek
Au, Ag

ANDERSON, PETE
- & B F Twitchell, Talkeetna,
PLACER, Yukon River,
Innoko Dist., Ganes Creek
Au, Ag

**ARCTIC ALASKA
FISHERIES AND
ENTERPRISES, INC.**

P.O. Box 93, Fairbanks
Pres: John Shelden
VP: C A Shelden, Adolph
Sec: Rudolph Yetter
MINE, 28
MINE, 28 N of Fairbanks,
between the Steese Hwy &
& Fairbanks Cr Rd, open pit,
Au, Ag, Pb, Sb
Prod: 10 tons daily
FLOT GRAV MILL:
Amalgamation with stamp mill
Prod: 25 tons quartz

ATLAS MINES

Box 105
Nome
PLACER, Seward Peninsula
Kougarok Dist, Dahl Creek
Au, Ag

BARTHOLOMAE, WM A
PO Box 187, Walnut, Calif.
Pres & Gen Mgr:
W A BARTHOLOMAE
GOLD PLACER MINE, Gold
Run Cr, Port Clarence
GOLD MINE, Ester Dome, via
Fairbanks
Eng: B W Vallat
Idls

**BELANGER, GEORGE &
CAMERON, JACK**
Box 1771, Palmer
PLACER, Copper River,
Nelchina Dist, Albert Cr
Au, Ag

BEN CREEK PLACERS

Eagle
Gen Mgr: B F Hansen
Asst Mgr: J H Hansen
PLACERS
under dev

BITTNER, PAUL

Central
PLACER Deadwood Cr, Circle
dist, hydraulic, Au, Ag

BLISS & SONS

Ungalik
PLACER, Bonaza Cr,
hydraulic dozer Au

**BROCKWAY, JOHN &
ELLIS, SID**

2550 E St., Bellingham,
Wash
MINE, SE Ala- Chicago Dist
Cobol-Chicago F island
Au, Ag
Under devel

**CANYON CREEK MNG
CO.**

ANKAK
Gen Mgr: Jens A Kvamme
PLACER on Canyon Cr, Aniak
dist, Kuskokwin R reg,
dozer slide-hydraulic,
Au

CARLSON, IVAR C

Ophir
MINE, Little Cr, Innoko dist
Au

**CARSTENS, HEINE, C &
DELTA**

Alaska Co, Central
PLACER, Portage Cr, Circle
dist, Au

CHANDALAR MNG CO.

513 3rd Ave, Anchorage
Op: Hugh Matheson, Jr
PLACER, Big, Chandalar
dist, nonfloat, Au

CHAPPELL, OLIVER L.

Wissman
PLACER, Yukon River,
Koyukuk Dist, Nolan Cr
Au, Ag

**CHATHAM CREEK MNG
CO**

Box 64, Fairbanks
Berg, Tooten & Wickstrom
PLACER, Last Chance Cr,
Fairbanks dist, Yukon R reg,
dragline-doser, Au

DELONG, RALPH

Box 114, Nome
PLACER, Seward Peninsula
Nome dist, Au, Ag

DICKMAN, ORVILLE J.

Teller, Alaska
PLACER, Seward Peninsula
Nome dist, Au, Ag

DICKMAN, ORVILLE J.

Teller, Alaska
PLACER, Seward Peninsula
Port Clarence Dist,
Gold Run Cr, Au, Ag

DONLIN PLACERS

Crooked Creek
Own: Robert F Lyman
PLACER in Snow Gulch 18 mi N
of Crooked Cr, Aniak dist,
Kuskokwin Riv reg, dozer, Au
Idls

**ENGELHORN, FOREST &
ORVILLE**

Talkeetna
PLACER, Cook Inlet-Sustina-
Yentna Dist, Au, Ag

COFFIELD L N

Cook Inlet-Sustina
PLACER, Black Creek, Cook
Inlet-Sustina-Valdes Cr Dist
Au, Ag

**COLLINSVILLE MINES,
A PARTNERSHIP**

1557 H St, Anchorage
GOLD PLACER, 2,500-yd
dragline & nonfloat wash pl,
100 air mi NW of Anchorage
Frm: Carl Durand
Under devel

CROWN POINT MINES

Box 1417, Seward
Gen Mgr: Elwood Nielsen
CROWN POINT MINES,
undergr, Au
MILL, Mile 23, Seward

DAHL CREEK MINE

709-5th Ave, Fairbanks
Op: C E Stout
PLACER, Dahl Cr,
Shungnak dist, Au
Idls

DEGNAN MNG CO.

Ophir.
Own: J A Degnan
Caroline Degnan
PLACER, Yukon River,
Innoko Dist, Eperanto Cr,
Au, Ag

**FAR NORTH DEVELOP-
MENT CO, INC**

1105 Shemandoth Dr,
Seattle 2
Pres: J John Bullock
VP: Ace Martin
Sec-Treas: E L Dreitsler
Oper Part: John W Raymond
& Frederick D Parker
PLACER, Candia, Au
Mgros: Frederick Parker
John Raymond

FERN GOLD MNG CO.

502 Columbia Bldg,
Spokane, Wash
Pres: J L Drumheller
VP: Martin Wolfson
Sec: L R Gordon
FERN MINE, Palmer,
undergr, Au
Idls

FLAT CREEK PLACERS

McGrath
Part: John E & Richard S
Fullerton
PLACER, Flat Cr, Au, Ag
Prod: 2,500 cu yds

FOSTER, NEAL W.

Box 280, Nome
PLACER, Seward Peninsula-
Fairhaven Dist, Cunningham
Creek, Au, Ag

FRANKLIN MNG CO.

Tok Junction
Part: Howard Bayless, Dick
Roberts, Robert Roberts
& Elia Roberts
PLACERS at Franklin &
Chicken, hydraulic, dragline,
dozer, Au
Idls

GATES & ROSANDER

Ophir,
Part: T Rosander
PLACER, Yukon River-
Innoko Dist, Bear Cr, Au, Ag

GOLD PLACERS, INC.

Coal Creek
Pres: Ernest N Patty
Mgr: Dale F Patty
Dir: E B Bull
Mrs A D McRae
Walter Seligman
PLACER, Circle dist, Au,
4 ft dredge
Idls

**GOODNEWS BAY MNG CO
INC**

422 White Bldg, Seattle 1
Wash
Pres: Andrew O Olson
VP & Gen Mgr: Edward Olson
Sec: G G Connor
Treas: C J Johnston

GOODNEWS BAY PLACER

Platinum
Gen Mgr: Edward Olson
Asst Gen Mgr: John W Weeks

HASSEL MNG CO.

Box 1071, Fair
PLACER, Ready Bullion Cr,
Fairbanks dist, Au

GRIOSBY, JACK L.

Box 776, Anchorage
PLACER, Yukon River-
Fortymile dist, Lost Chicken
Hill, Au, Ag

HANCOCK, K S

General Del., Haines
PLACER, SE Alaska, Juneau
Dist, Au, Ag

**HAVRILACK, HARRY F.
MNG CO.**

Rampart, Alaska
PLACER, Yukon River-
Rampart Dist., Ruby Cr, Au,
Ag

HEFLINGER, CARL

409 Clara Street,
Fairbanks
REDSTONE MINE, Yukon
River-Livengood Dist

HICKOK & ENGELHORN

Talkeetna,
Clara Hickok, Forest Engelhorn
THUNDER CREEK PLACERS
Cook Inlet-Sustina-Yentna Dist,
Au, Ag, Placers

HOLMES, WALTER L

May Creek via Cordova
REX CREEK MINE, Nisina
dist, Mary Cr, Via Cordova,
open pit, hydraulic, Au
Under devel

HOOGEORN, JACK

Nome
PLACER, Seward Peninsula-
Fairhaven Dist., Imachuk
River, Au, Ag

HUNTER CREEK MNG CO

c/o Melo Jackovich, Rampart
PLACER on Hunter Cr,
Rampart dist, hydraulic-doser,
Au
Idls

HYDER MINES, INC.

804 4th Ave, Seattle 4, Wash
Pres: Donald H McNelly
VP: Edward R Sheat
1st VP: Mike Welsh
Sec: J W Boothe
Treas: Dr Robert L Camber
RIVERSIDE & CANTU MT MINES
Hyder, undergr, Pb, Ag, Au
WO₃, Cu, Zn
Mine Supt: Carl C Wikstrom
Geol-Met: Henry L Hill &
Assac
Prod: 20 tons
50 - TONS FLOT MILL,
Riverside
Mill Supt: Carl C Wikstrom
Under devel

I L & M MNG CO

Box 2015, Ketchikan
Pres: Les Hollenbeak
VP: Irma Hollenbeak
Sec: Charles W Miller
I L & M MINE, Kenrick Bay
Ketchikan dist, U₃O₈
Idls

IMPERIAL JADE CO.

Kutzebe
Own: G Joiner
PLACER, Jade Min, jade
gemstone, undergr
Prod: 100 lbs daily

INMACHUK MNG CO.

Deering
INMACHUK PLACER, Deering
Own: Grant H Nelson
Floating Dredge
Prod: 2,000 yd per day

JAK MNG CO.

1385 Crosson St., Fairbanks
Part: Joe Bayless
Ken Ringstad
PLACER, Yukon River,
Bonnifield Dist, Au, Ag

JOHANSEN, ENGBRET

Chicken, Ala
PLACER, Yukon River-40 mile
Dist, Ingle Cr, Au, Ag

JOHNSON, PETE

Manley Hot Spring
PLACER, Yukon River,
Hot Springs Dist, Baroka-
Baker Crs, Au, Ag

JOT MNG CO.

Oklahoma City, Okla
MINE, SE Alaska-Ketchikan
Dist, U₃O₈
Under devel

KENDRICK BAY MNG CO

Mines Park, Golden, Colo
Pres: Frank Coolbaugh
VP: W Jones
Sec: John P Fitts-Gibson
Treas: J D Carnahan
KENDRICK BAY MINE, Prince
of Wales Island, Alaska
open pit, U₃O₈
(Leased to Jof Mining Co)
(See Colo)

KETTENDORF, JAMES

Box 637-Hagamon Rd
Fairbanks, Ala
PLACER, Yukon River-
Fairbanks Dist, Rosie Cr,
Au, Ag

**KODIAK EXPLORATION
CO, INC.**

Box 464, Kodiak
Pres: George H Cornelius
VP: Emil Knudsen
Sec: Einar Neeth
Treas: Robert von Scheele
Purch Agt: Henry Neseth
KECO PINK ROCK MINE,
Kodiak, undergr, WO₃, Cu,
Au, Ag
Gen Mgr: Henry Neseth
Asst Gen Mgr: Tom von Scheele
Geol: Charles H Scott
Mech Eng: Walter Achen
CLAIMS, undergr, open pit,
placer, U₃O₈, WO₃, Au, Cu,
Ni, Co, Ag
Under devel

LANGLOW, JENS

Central
PLACER, Yukon River-Circle
Dist, Switch Cr, Au, Ag

LANNING, TONY

Hot Springs
PLACER, Yukon River-Hot
Springs Dist., Thanksgiving
Cr, Au, Ag

LAST CHANGE MNG CO

Box 639, Nome
Op: William S Muna
PLACER, Bluff, Au, Bucket-
line floating dredge
Idls

LINDQUIST, HJALMAR

Ophir, Alaska
PLACER, Yukon River-Innoko
Dist, Badrock & Ester Creeks
Au, Ag

**LITTLE MINOOK MNG
CO**

Fairbanks
Pres & Gen Mgr: Albin Martin
PLACER on Little Minook Cr,
Rampart dist, dragline-
hydraulic-doser, Au, Ag

**LITTLE SQUAW MINING
CO.**

309 Radio Central Bldg,
Spokane 4, Wash
Pres: K W Jasper
VP: E. Andersson
Sec: E K Barnes
MUKADO MINE, Chandalar,
Alaska, undergr, Au
Under devel
Gen Mgr: F Birch

LONG CREEK MNG CO

Ruby
Gen Mgr: Hans Tilleson
PLACER at Long Cr,
hydraulic dozer-dragline, Au,
Ag

LUCKY NELL MINE

Hollis
Own: J J Matoska
MINE, 7 mi W of Hollis,
undergr, Au, Ag, Pb, Cu
Under devel
FUYALLUP MINE, 1 1/2 mi W
of Hollis, undergr, Ag
Under devel
CASCADE MINE, 3 mi SW of
Hollis, undergr, Ag
Under devel

LUCKY SEVEN MINE
Miller House
Op: Walter Roman
PLACER, Mastodon Cr, Circle
Dist, dozer-hydraulic, Au

LUCKY SYNDICATE
Box 515, Nome
Parts A. L. Schneider
B. L. Godfrey
PLACER, Seward Peninsula-
Kougarko Dist
Kougarko River, Au, Ag

LYNK CREEK MINE
Grant Creek, Tanana
Part: Lars Indegard
Frank C. Edgington
E. R. Edgington
PLACER, approx 35 mi W of
Tanana
Under devel

**MACLAREN RIVER
COPPER CORP**
Box 1282, Fairbanks
Pres: Everett O Albertson
VP: Warren A Taylor
Sec-Treas: Jan Bannister
KATHLEEN-MARGARET MINE
head of MacLaren River, undergr
Cu, Au, Ag
Gen Mgr: E O Albertson
Under devel

MARTIN, GLEN
Circle Hot Springs
PLACER, Yukon River-Circle
Dist. Portage Cr, Au, Ag

**MARVEL CREEK MNG
CO.**
Aniak
Mgr: C J Awe
PLACER, Kuskokwim River
Aniak Dist., Marvel Cr, Au, Ag

MINALASKA, INC.
Ophir, Ala
Warren E Magnuson
PLACER, Yukon River-Innoko
Dist, Ganes Cr, Au, Ag

MISCOVICH BROTHERS
Poorman, Flat
Part: George Miscovich
John A. Miscovich
Howard Miscovich
Andrew Miscovich
PLACER, Yukon Cr, Iditarod
Dist.
PLACER, Poorman, Au
Idle
PLACER, Flat, Au
Idle

**MONETA PORCUPINE
MINES, LTD**
330 Bay St., Toronto 1
Ontario, Canada
MINE, SE Ala-Petersburg
Dist. Endicott Arm, Cu
Under devel

**MONTE CRISTO MNG CO
INC.**
Oakana
Robert W. Bank
PLACER, Copper River-
Chistochina Dist. Slate Cr.
Au, Ag

MT PARKER MNG CO
Box 2127, Juneau
LEROY LODGE MINE, SE Ala-
Juneau Dist., Au, Ag
Under devel

NESLAND, ERLAND
Koyukuk
PLACER, Yukon River-
Koyukuk Dist. Vermont Cr,
Au, Ag

**NEW YORK-ALASKA
GOLD DREDGING CORP**
2503 Smith Tower, Seattle
Wash
Pres & Man Dir: J K Crowley
VP: Mark Mathewson
Sec: Leise G Robbins
Treas: Fannie Barley
Purch Agt: L E Robbins
NEW YORK-ALASKA MINE,
60 MI NE of Bethel, placer,
3 dredges, dragline, Au
Res Mgr: Wm H Race
Elec Engr: Clarence Clark
(See Wash)

**NORTH AMERICAN
DREDGE CO**
Flat
Own: Alex Mathieson
PLACER, Flat, Iditarod Dist
2,900 yd bucketline, dredge,
Au
Idle

**NORTHERN LIGHTS MNG
CO**
Ruby
Gen Mgr & Mech Engr:
Michael Carroll
PLACER, Ruby Dist, Au

NOVATNEY, ROBT A
104 West 9th St, Juneau
Sec-Treas: Dorothy H Novatney
MILLER LEDGE & LODGE, Helm
Bay, open pit, Au, Ag
Under devel

NUCKET MNG CO.
Box 585, Nome
MINE, Nukluk River, Council,
placer AU, Ag
Gen Mgr: Steve Pederson
opr a placer dredge in
summer months

OLIVE CREEK MINES
Box 532, Fairbanks
Own-op: Carl Parker
PLACER on Olive Cr, 60 mi
NW of Fairbanks, dragline-
doser, Au, Ag
Idle

OTTER DREDGING CO
Flat
John Ogria
PLACER, Yukon River,
Iditarod Dist, Otter Cr, Au, Ag

PEKOVICH, W S
Box 2642, Juneau
MINE, Port Snettisham,
Juneau Dist, Fe
Under devel

PILGRIM, EARL R & CO
Box 1989, Fairbanks
Own & Gen Mgr: Earl R Pilgrim
STAMPEDE MINE, Stampede
110 mi SW of Fairbanks,
undergr, Sb
40-TON ONAV MILL
Idle

PITTS, E H
Big Lake
PITTS PLACERS, Big Lake
hydraulic, Au, Ag

PRICE, STANTON
% Dean Goodwin
Box 1262, Juneau
PLACER, SE Alaska-
Admiralty Dist. Spruce Cr-
Windham Bay, Au, Ag

PRINCE CREEK MNG CO
Flat
Own: Harry Agoff
PLACER on Prince Cr, Iditarod
Dist, Yukon Riv region
hydraulic, Au

PRINGLE, AW
Hot Springs
PLACER, Yukon River-Hot
Springs Dist. Rhode Island Cr
Au, Ag

**PURDY, FRED AND
ARTHUR**
Chicken
PLACER on Myers Fork, 40 mi
Dist, Yukon Riv, region, dozer-
hydraulic, Au

PURKEYPILE CO.
118 1st St, Hamilton Acres
Fairbanks
GRANDVIEW MINE, 17 mi SW of
Mt Russell, open pit, Ag, Cu, Pb
U, O, WO, Zn
Gen Mgr: W Purkeypille
Under devel
TOZIMORAN MINE, 30 mi W of
Tanana
Idle

**QUEBEC METALL INC
LTD**
c/o J Bonkowski, Box 46
Haines
PLACER & LODGE, near
Kukhuva Juneau Dist, Fe
Under devel

RICE, HARRY
Wasilla
INDEPENDENCE MINE,
Cook Inlet-Bustina-Willow Cr
Dist Lode Au, Ag

RAMBAUD & HANKS
Chicken
PLACER, Yukon River,
Fortymile Dist, Jack Wade Cr
Au, Ag

ROBINSON, GEORGE F
Boundary
PLACER, Yukon River-
Au, Ag

ROSANDER & REED
Ophir
Free: T Rosander
PLACER, Yankee Cr,
Innoko Dist. hydraulic-doser-
dragline, Au

SAVAGE, PAT
Ruby
PLACER, Long Cr

SCHAEFER, RUSSEL R
Aniak
CHINABAR CR PLACER,
Kuskokwim Riv, undergr, Hg
Prod: 10 tons
10-TON MILL, at mine

SLATE CREEK MNG CO
Box 1944, Fairbanks
PLACER, Slate Cr,
Koyukuk Dist. Au, Ag

SQUAW CREEK MNG CO
Fairbanks
Op: Edwin C Gelvin
PLACER, Squaw Cr, Circle
Dist, Au
Idle

STANICH BROS
Fairbanks
PLACER, Porcupine Cr,
Koyukuk Dist, Au

STANBERG MINES, INC
938 4th Ave, Anchorage
PLACER, Colorado Cr, Innoko
Dist: Indian Riv, Hughes Dist
Eureka Cr, Hot Springs Dist,
Au
LODE PROSPECT, Yentna
Dist, Au
Under devel

STUVER, JULIAN
Flat
PLACER, Yukon River-
Iditarod Dist, Upgrade Cr,
Au, Ag

SWANSON, CARL
Box 371, Nome
Part: Carl Swanson
SWEEPSTAKES PLACER,
Seward Peninsula-Koyuk Dist

TALKEETNA MNG CO
Talkeetna
Mgr: Phillip Brandt
PLACER, Cook Inlet-Bustina-
Yentna Dist. Derman Claim on
Cache Cr, Au, Ag

TWEET, NB & Sons
Teller
PLACER, Seward Peninsula-
Kougarko Dist
Kougarko River, Au, Ag

**U S SMELTING,
REFINING & MNG CO**
Box 1170, Fairbanks
VP & Gen Mgr, Alaskan Oper:
J D Crawford
FAIRBANKS DEPT, 6 gold
dredges in Fairbanks area
Mgr: J C Boswell
Aline Supt: T A Loftus
Dredge Supt: W A La Fon
Cashier: J L Reed
Prod: 6,000,000 cu yds
gravel
HOOGATA OPERATIONS, 1
gold dredge
Supt: Clay La Fon
Prod: 800,000 yds gravel
CHICKEN OPERATIONS:
Supt: Paul Clemmons
Prod: 100,000 yds gravel
NOME DEPT, 3 gold dredges

Mgr: C S Glavinovich
Cashier: Robert Baldwin
Prod: 3,000,000 cu yds
gravel
(see Ariz, Mass, M Mex, Utah)

U S STEEL CORP
585 William Penn Pl,
Pittsburgh 30, Pa
EXPLOR, SE Alaska
Under devel
(see Ala, Calif, Minn, Pa, Tenn,
Utah, Wyo)

UOTILA, GUS
Ophir
Ophir Cr PLACER, Au

WACKWITZ, FRED
Box 1593, Fairbanks
PLACER, Bedrock Cr,
Fairbanks Dist, shovel-in, Au
LODE, head of Chovay Cr, Fe
Idle

WATKINS, ROBERT L
Box 121, Fairbanks
HOPE PLACER, Yukon River
Fairbanks Dist, Faith Cr
Au, Ag

WEINARD, O F & FRED
Candle
PLACER, Seward Peninsula-
Fairhaven Dist. Mud Cr
Au, Ag

WEISNER TRADING CO
S Ira Weisner
Rampart
PLACER, Yukon River-
Rampart Dist. Little Minook
Cr. Au, Ag

**WESTERN ALASKA
MNG CO**
Box 121, Spenard
Op: R J Anderson
MINE, Hg
Under devel

KAISER, CLARENCE
PLACER on Greensome Cr,
drift, Au

WOLF CREEK MNG CO
Box 141, Fairbanks
Pres: Andrew Anderson
VP: Allan Ostberg
Sec-Treas: Manie Olson
Asst VP: John Osberg
PLACER, Fish Cr, 30 mi W
of Fairbanks, Au
Gen Mgr: Manie Olson

ZAISER, LEONARD
Medfra
PLACER, Kuskokwim River
McGrath Dist. Birch Gulch
Au, Ag

ALABAMA

**ALABAMA FLAKE
GRAPHITE CO**
330 Comer Bldg.
Birmingham
Pres-Treas: W L Shumate Jr
VP: W L Moore, B J Carder
Sec: W C Dempsey
Asst Sec: Joseph Sims
Properties lease to
INDUSTRIAL MINERALS CORP
1129 Vermont Ave NW, Wash
DC
Pres: Joseph O Wall
Sec: Marshall Stewart
Treas: Tony D Pittman
POCAHONTAS MINE 4 1/2 mi
W of Ashland, Ala, open pit
crucible graphite, mica
Under devel
500-TON FLOT MILL
Idle

AMERICAN TALC CO
Chatsworth Ga
Pres: M Woodward Glenn
VP: Francis T Glenn
Sec: J R Ferry
MINE, WINTERBORO, open
pit, talc
Mine Supt: N R Davis
Prod: 100 tons
80-TON GRAVEL MILL,

Alpine Mill Supt: T E Davis
Intermittent operation
(See Ga)

ARRINGTON MNG CO
Cedarburg, Ga
WASH PLANT, Glenwood
Brundidge, Pike County, Fe

DIXIE MINES, INC.
Box 355, Heflin
Pres & Treas: Ernest
Kretschmar
VP & Purch Agt: Joe W Bailey
Sec: Robert Abbott
Adm Asst to Mgr: Eldridge
Loundermille
SHEFFNER MINE, Micaville
open pit, mica
Gen Mgr: Joe W Bailey
Mine Frm: Glenn Gibson
Mill, wash, screen tabling
Mill Frm: Almond Hughes
Grinding Plant, Heflin

GENERAL GRAPHITE CO)
Birmingham 3
Pres-Treas: A L Shumate Jr
VP: E J Watkins
S P McDonald Jr.
Sec: J F Berry Daugh
Asst Sec: J Sims
Owner of Alabama Flake
Graphite Co.

**GLENWOOD MNG CO,
INC**
Glenwood
Pres & Gen Mgr: I D Gibson
VP & Asst Gen Mgr: C B Gibson
Sec-Treas: D F Jackson, Sr
GLENWOOD MINES, open pit
Fe
Gen Supt: H A Patton
Mech Engr: M G Cornett
Prod: 1,000 tons
MILL
Mill Supt: W D McLeod
Asst Mill Supt: H H Patton

**HARRISON-WALKER
REF CO**
1800 Farmers Bank Bldg
Pittsburgh 22
EUFALA MINE, Alabama
Bauxite

REPUBLIC STEEL CORP
PO Box 2394, Birmingham
EDWARDS MINE, undergr, Fe
Gen Mgr: B H McCrackin
Mech Engr: A E Higginbotham
Elec Eng: T A McDougal
Ch Engr: R B Watt
Mine Supt: B C Jones
Mine Frm: Aaron Benson
Mine Engr: T P Castallotte
Prod: 3,500 tons
SPAULDING MINE, undergr
open pit, Fe
Mine Supt: J C Blackwell
Mine Frm: J E Jackson
Idle
(see Mich, Minn, NY, Ohio)

**SOUTHEASTERN COAL
& IRON CO**
Ridgely Apts., Birmingham
DUDLEY MINE, Tuscaloosa,
Fe

**SHOOK & FLETCHER
SUPPLY CO**
1814 1st Ave N, Birmingham
Pres: P O Shook
VP: A M Shook, III
Sec-Cust: H O Thomas, Jr.
Purch Engr: L M Quick
BLACKBURN & WARNER
MINES, Russellville, surface,
Fe
Gen Mgr: E N Craddock
ADKINS MINE, Woodstock,
surface, Fe
Gen Mgr: H C Gunter
Prod: 3,500 tons
FAITH GAP MINE,
surface, Fe
(see Mo)

SMITH MNG CO, THE
Laverna
SMITH BROWN ORE MINE, Fe

US PIPE & FOUNDRY CO
3300 1st Ave N Birmingham
Pres: C S Lawson
VP: R E Garrett
Sec: J W Brennan
Treas: W S Wilson
Purch Agt: H E Cross
Gen Supt: J W Nicel

Geot Jack E Morris
Mngt Eng: Gen Jones
Met: R H Stacey
Elec Eng: L E Shiffman
Safe Eng: J A Downey
RUSSELLVILLE MINE, 5 mi
SW Russellville, surface
Fe

Supt: S A Britton
Frm: Hobart Norton
H Mc Allister
HEAVY MEDIA MILL
Prod: 2,000 tons of (brown)
ore

BLAST FURNACES,
Birmingham
Gen Supt: Dan Watkins
RUFFNER #1 MINE, Trundle
7 mi E of Birmingham,
undergr, Fe (red ore)

U S STEEL CORP
**TENNESSEE COAL &
IRON DIV**
PO Box 599, Fairfield
Pres: A V Wiebel
Exec VP: J W Kline Jr.
VP-Oper: W E Crouch Jr.
Mgr: Ray Mast: E P Reed
Ch Eng: Ray Mast
W S Springer
Dir of Purchases
L C Teague
IRON ORE CA
IRON ORE MINES & COND
PLATE CAPTIVE, 6 undergr
mines near Bessemer
Cap: 4,881,600 net tons
crude iron ore yrlly

Gen Supt, Ore Mines &
Quarry: AW Beck Jr.
Supt, #7, 8, 9 & 10 Mines:
F J Zakow
Supt, #11 & 14 Mines &
Dolanah quarry:
R W McEniry
Supt Ore cond plant: G W Neal
(See Alaska, Calif, Minn, Pa,
Tenn, Utah, Wyo)

WILSON, D M BAUXITE
CO
Eufaula
ORLEE MINE

WILSON, R E MNG CO
PO Box 9, Eufaula
Pres: R E Wilson
Part: Anne C Wilson
Sec: L Linda W Braaswell
EUPAULA MINES, bauxite
Prod: 87 tons
80-TON MILL, Eufaula
Supt: John Paul Taylor

WOODWARD IRON CO
Woodward
Chmn of Ed: John E Urquhart
Pres: W R Bond
VP: John Hager
VP-Sec: D T Turnbull
Treas: W R. Cottrell, Jr.
Met: F U Leonard
Safe Eng: Stanley Mooney
Purch Agt: H K Stokes
PLYNE MINE, 8 mi S of
Bessemer, undergr, Fe
Prod: 5,000 tons
Mine Supt: W T Davis
Asst Mine Supt: W H Thompson
Mine Eng: E E Sullivan
BLAST FURNACE, Woodward
Supt: WW Price Jr.
Asst Supt: C Y Huff
Prod: 772,632 net tons yrlly

ARIZONA

A A MNG CO
Box 3358, Globe
Pres: C Allison
MINE, Asbestos
Idle

ALBA MNG CORP
Sanders
MINE, Apache City, surface
benzotite
Mgr: Spencer Balcomb Jr.

ALTUDA MINES, INC.
PO Box 1743, Yuma
Pres: Doyle C Gills
VP: Carroll Reed
Sec-Treas & Gen Mgr:
Harry E Hamilton
ALTUDA MINE, 25 mi SE of

GILA BEND, undergr, open pit,
As, Ag, silica flux
Idle

**AMBROSIA MINERALS,
INC.**
763 1st National Bank Bldg.
Phoenix
LUCKY STRIKE MINE,
Socorro Co, N Mex, U₃O₈
(See N Mex)

**AMERICAN ARIZONA
METALS CO**
Mgr: Mr. Harriett
MINE, Yuma County, Au,
Ag, Cu

AMERICAN FIBER CORP
Box 2980, Globe
Pres: A H McRae
VP: Harry Anderson
Sec: John Peterson
Purch Agt: Grady Gullidge
ROCK HOUSE, Gila County
open pit, undergr, asbestos
Gen Mgr: Grady Gullidge
Gen Supt: Marlin Reeves
Mine Frnt: J Peres,
W Jenkins
Prod: 100 tons
50-TON MILL, Chrysotile mine
Mill Supt: M Reeves
Under devel

**AMERICAN SMELTING
AND REFINING CO**
WESTERN MNG DEPT SW DIV
813 Valley National Bldg.
Tucson
Mgr: T A Snedden
Asst Mgr: A C Hall
Ch Geol: Kenyon E Richard
HAYDEN PLANT, Hayden,
1200-ton smelt and conv, Cu
Supt: E E Groff
SW ORE PURCH OFFICE
810 Valley Nat'l Bldg, Tucson
Mgr: Reed F Welch
SILVER BELL UNIT, Silver
Bell, surface, Cu
Gen Supt: D R Jameson
Prod: 7,500 tons
MILL, Silver Bell, Flot
MISSION UNIT, Sahaurita
Gen Supt: RB Mern
Under devel
(See Calif, Colo, Idaho, Ill,
Md, Mont, Nebr, N J, N Mex,
N Y, Tex, Utah, Wash, &
Federal Mng & Smelting Co, Mo)

**AMERICAN ZINC, LEAD
& SMELTING CO**
1515 Paul Brown Bldg.,
St Louis, Mo
HILLTOP MINE, Portal, undergr,
Fe, Zn, Ag, Cu
Idle
(See Ill, Mo, N M, Ohio, Okla,
Tenn, Tex, Utah, Wash, Wisc)

AMPET CORP
523 Colorado Bldg, Denver,
Colo
Pres: R A Gus Davis
VP: Robert J Paul
Sec-Treas: Alfred O Brehmer
MINE
(See Colo, Utah)

**ARICANA-SENATOR MNG
CO**
119 Adelaide St, W, Suite 208
Toronto, Canada
Treas: C A Wuest
SENATOR MINE, 14 mi E of
Prescott, Yavapai Co, undergr
Au, Ag, Pb, Cu, Zn

ARI-VADA DEVEL CO
Box 25, Yucca
McCracken MINE, Mohave
County
Under devel

ARIVADA MNG CO
Box 118, Wenden
VP-Gen Mgr: Dan Wentworth
Supt: Percy H Ramsden
MCCRACKEN MINE, Signal
Mohave County, undergr, Ag,
Pb
Under devel
800-TON MILL

ARIZONA DIATOM, INC.
3701 W Indian School Rd,
Phoenix
MINE, Whitecliff, Pinal County

ARIZONA GYPSUM CORP
PO Box 6192, 2255 S 19th Ave,
Phoenix

Pres: John F Fisher
VP, Mine Supt: James M
Champer Sr
Sec, Purch Agt, William J
Keesler
Treas: John M. Haselett
ARIZONA GYPSUM MINE, PO
Box 54, Winkelman, open pit
gypsum
MEL, crush & screen

ARIZONA MINE, THE
Box 67, Humbolt
Gen Mgr: Verdin Alexander
ARIZONA MINE, THE, 2 1/2
mi W of Humbolt, Au, Ag, Pb,
Zn
Idle

**ARIZONA MOHAVE MNG
CO**
Box 385, Kingman
Own: Earl H Duke
MECHANIC MINE, Mohave
County, Au, Ag
Under devel

B S & K MNG CO
Suite 702 1st Nat'l Bank Bldg.
411 N Central Avenue, Phoenix
Pres & Gen Mgr: A M Kalaf
VP: George Kalaf
Sec-Treas: Lee Newsom
ATLAS MINE, Box 10, Silverbell
10 mi SW of Red Rock, undergr
Cu, Zn
Geol: A M Rugg Jr.
Mine Frnt: Walter Whitlow
125-TON FLOT MILL, 10 mi SW
of Red Rock
Mill Frnt: Milton Reeves

BAGDAD COPPER CORP.
Box 243, Bagdad
Pres: David L Lincoln
Exec VP: Geo W Colville
Sec: R N Jamison
Purch Agt: Edgar Kellis
Controller: Maurice Thon
BAGDAD MINE, Bagdad, open
pit, Cu, Co, Ag
Gen Mgr: G W Colville
Asst Gen Mgr: R C Bogart
Mech Eng: C W Myers
Geol: R J Bonnis
Met: E S Howell
Elec Eng: W D Dacon
Safety Eng: H W Lee
Mine Frnt: D S Pike, Van Irwin
Mine Supt: E LeRoy Jones
Prod: 5,000 tons
**5,000-TON COPPER FLOT
MILL**, Bagdad
Mill Supt: Gaylen W Guest
Mill Frnt: A T Weatherhead
H P Mullins
Assayer, D T Holmes

**BALD EAGLE GOLD MNG
CO**
Box 91, Bull Head City
Pres-Gen Mgr: Quincy Crane
**MOTHER LODE, THREE
BURROS GRPS**, San Francisco
Mng dist, Mohave County, Au
Under devel

BALESTEROS, RICHARD
Ajo
SAN ANTONIO MINE, Pima
County, SiO₂

BANNER MNG CO
2042 Corner Stravende
Tucson
Pres: L L Travis
VP & Gen Mgr: A B Bowman
VP: L L Travis, John M Wallace
Sec-Treas: James E Hogle
Purch Agt: E C Bowman
DAISY & MINERAL HILL MINES
Tucson, undergr, Cu, Ag
Gen Mine Supt: B W Venable
Chf Act & Asst Sec: F C Prince
Mine Supt: Gus Holaworth
Mine Surv: Norman Harvey
Geol: F D Mackenzie
Plant Mech: E E Bray
Plan Eng: G E Jackson
Chem: R G Miranda
Chf Elec: H Rodgers
TWIN BUTTES MINE, Tucson
Idle
1,000-TON FLOT MILL, Mineral
Hill Mine
Supt: Frank Norton
(See N Mex)

HUGH & RUTH G BARTON
PO Box 323, Holbrook
MINE, U₃O₈

BANTA & BEKINS
Nogales
JOE BANTA MINE, Santa Cruz
County, undergr
Idle

**BECCHETTI COPPER
CORP**
1802 S Main St, Las Vegas
Nev
Pres: Anton D Beccchetti
VP: Arthur Kando
Sec: William Kaddie
Treas: George Hansmann
CLIFF & SILVER PLATE MINE
Box 383, Cottonwood, undergr
Cu, Au, Ag, Th
Idle

BIG HOLE MNG CO
c/o Albert Adams, Box 125
Jerome
UNITED VERDE MINE, Yavapai
County, open pit, Cu

BLAKEMORE, PAGE P
c/o Cameron Mng Co.,
Cameron
Elwood Canyon #2, Jack Daniels
#1
Cameron, undergr, open pit
Prod: 10 tons
Mine Supt: Rollin Dunlap

**BLUE JESTER MINES
INC.**
510 W Francis, Tempe
BLACK JACK MINE, Pima
County, undergr, Au
Gen Mgr: Russell Wright
Idle

**WALTER BOPP MINING
CO**
43 S 8th Ave, Tucson
Gen Supt: L Jarragin
SILVER RAY, 14 mi W Amado
undergr, Ag

**BORE-TREE SADDLE
MNG CO**
Globe
Mgr: C L Moore
GOLDEN GOOSE MINE, Gila
County, Asbestos
Idle

BRACKEN MNG CO
Box 111, Agula
OSO NEGRO (BLACK BEAR)
MINE, undergr, Mn
Gen Mgr: R J Bracken
Idle

BUCKEYE MICA CO
Box 416, Buckeye
Pres & Gen Mgr: H G Smith Sr
VP: H G Smith Jr
Sec: W Peakocke
BUCKEYE GROUP, 2 1/2 mi S
of Buckeye, undergr, Mica
(muscovite), Sericite, Be
Feldspar
Supt: A Duncan
Asst Supt: C Murphy
Frm: C V Hill
Prod: 100 tons
LUCKY CHANCE 1-2-3, 5 mi
W of Quartzsite, Sericite
Prod: 25 tons
Under devel
**100-TON DRY & WET GRINDING
MILL**
Supt: J G Smith Jr
Frm: Wayne Watts

BUNDY, C M
Mt Turnbull (via St George,
Utah)
RED WING MINE, open pit
Cu, U₃O₈
Under devel

BURNEY MINES, INC
Box 364, Oracle
COPPER ROSE MINE, Pinal Co.
25-TON MILL
Idle

BURNEY AND DE ROSE
Box 364, Oracle
CHILDS, ALDWINKLE MINE
Pinal County, Cu
Under devel

CALARI MNG CO
2999 Linden, Long Beach 7
Calif
Pres & Gen Mgr: L F Albrecht

Sec-Treas: C M Smith
RUTH MINE, Box 941, Prescott
6 mi S of Prescott, undergr, Zn
Po, Cu, Ag, Au
Idle

CAMERON MNG CO
(STEINBERGER & BLAKEMORE)
Cameron
E Canyon 1, JUAN HORSE 3 & 4,
Yavapai
MINES, Cameron Dist, Coconino
County, undergr, open pit,
U₃O₈
Prod: 30 tons daily
Gen Mgr: P P Blakemore
Gen Supt: Rollin Dunlap
Geol: Louis W. Cramer

**WILLIAM J CAREY MNG
CO**
1801 First Nat'l Bank Bldg.
Denver, Colo
Pres: Wm J Carey
VP: Harry E Haynes
JOHN TODDE MINE, Coconino
County, undergr U₃O₈
Gen Mgr: Harry E Haynes
Asst Gen Mgr & Geol:
Edw W Fieldman

**CENTENNIAL DEVELOP-
MENT CO**
Box 5671, Tucson
Pres: H B Spencer
(See Utah)

**CENTURY MOLYBDENUM
COPPER CO**
55 N Mainlock St, Mesa
Pres: Arnold H Johnson
VP: Paul N Johnson
Sec-Treas: Neelen D Johnson
Purch Agt: A H Johnson
**RARE METALS MOLY, BLACK
COPPER MINES**, 9 mi S of Ray
undergr, Mo, Cu, Au, Ag
Mine Supt: Gen Mgr: A H Johnson
Asst Gen Mgr: Paul N Johnson

CHILITO MINE GROUP
Box 1086, Hayden
Own: B C Velasco
CHILITO MINE GRP, Gila
County, open pit, Cu, Silica
Prod: 50 tons
(Leased to Gordon Wainwright)

CLARK, FRANK
Box 334, Bowie
SILVER STRIKE MINE, 19 mi S
Bowie, undergr, Pb, Zn, Au, Ag
Under devel
TUPATEX MINE, 14 mi N Bowie
surface, tufates

CLIMAX URANIUM CO
(SUBSID AMERICAN
METAL CLIMAX INC)
Box 1901, Grand Junction, Colo
VP & Gen Mgr: A M Mastrovich
URANIUM EXPLOR & PROD,
Navajo Indian Reservation
(See Colo, NY, Utah)

COBRE GRANDE MNG CO
PO Box 217, Duncan
Gen Mgr: Tom Beard
COBRE GRANDE MINE, Graham,
open pit, Cu, Pb, Zn, Co
Under devel

COMPLEX COPPER INC
358 E 1st St, Los Angeles 12,
Calif.
HUMBOLDT COPPER MINE,
Box 642, Prescott, Ariz.,
mine loc at Humboldt, under
devel, Cu, Ag, Au, undergr
& open pit
Gen Mgr: E C Mahnken
FLO & LEACH MILL, Humboldt,
under const.
Prod: 100 tons daily
(See Calif)

COPPER HILL MINE
Box 369, Globe
Leases: E M Moores, Jr.
MINE, open pit, siliceous
copper ores
Prod: 50 tons daily

B W COPELAND MINES
311 S Montezuma St, Prescott
Own: B W Copeland
**C & A MICA & FAIRY TALE
MINES**, West Yavapai County, Cu
Ag, Au
Idle

COPPER ACE MNG CO
Box 147, Yarnall
Own: B M Ramsey
STRIP & OPEN CUT DEVEL, 8
mi e of Kirkland Jet, Cu
Idle

COPPER HILL SILICA
Globe
COPPER HILL SILICA PIT,
Gila County, surface, Cu, S
Mgr: E M Moores, Jr.

**CORONADO COPPER &
ZINC CO**
523 W 8th St, Los Angeles,
Calif

Pres: K Lieber
VP: R T Mudd, FWAllen
Sec-Treas: C W Six
JOHNSON CAMP UNIT, Cochise
County, undergr, Pb, Zn
Prod: 200 tons daily
(Leased by MacFarlan & Hurlinger
(See Calif)

COSTELLO ESTATE
P O Box 547, Tombstone
DEFIANCE MINE, Cochise
County, Pb, Zn
Idle

**COVERED WELLS
COPPER CO**
4355 E Elmwood, Tucson
Pres: Milton F Graf
ST PAT COPPER MINE, Pima
County, Cu
Under devel

CYPRIUS MINES CORP
523 W 8th St, Los Angeles 14
Calif

OLD DICK MINE, Box 548
Bagdad, undergr, Cu, Zn
Res Mgr: Curtis Sundeen
Mine Supt: D P Turberville
Geol: J Browne
Met: L Yundt
Met: Mech: H Sharff
Mech Eng: Herbert Dahmon
Chf Ckr: W Nelson
Mine Supt: Joseph Sierakowski
Mine Frnt: I Bradford
Mine Eng: J Browne
Prod: 240 tons
240-TON FLOT MILL, Bagdad
Mill Supt: A Hunt
Assay: H Bollweg
(See Calif., Colo)

DASCO MINES CORP
67 W 2nd St, Yuma
Pres: M O Wallace
VP: A T Morgan
Sec: M Doyle
Treas: N Doyle
MILL, Wenden, Au, Ag, Pb, Cu
Prod: 200 tons daily

DIAMOND URANIUM CORP
810 Felt Bldg, Salt Lake City,
Utah
MINE, U₃O₈

**DIXIE QUEENE MINES
INC**
c/o Phillips Motors Inc., 323
N 2nd St, Phoenix
DIXIE QUEENE MINE, Yavapai
County, Pyrometites
Idle

DOMINO MNG CO
1721 Sunset Dr., Flagstaff
Pres: T J Ellis
VP: C O Ware
AMENDED HUSKAN #8, Little
Cole Mng Dist, Cameron Area,
open pit, U₃O₈
Gen Mgr: T J Ellis
Prod: 4 tons daily

DOYLE MINE
Wenden
Own: Harrison Doyle
R N Doyle
A T Morgan
DOYLE BLACK BAND MINE,
Wenden, Mn, undergr, open pit
Idle

**DUVAL SULPHUR &
POTASH CO**
178 Fir, Mollie Espereon
Bldg, Houston 2, Texas
Pres: W P Morris
VP: G E Atwood
VP & Treas: Eugene German
Sec: V J Thornhill
Adm Asst: B G Nasser
COPPER DIVISION

ESPERANZA MINE, Box 11377,
Tucson 3, open pit, Cu, Mo
Res Mgr: G E Atwood
Asst Res Mgr: C B Curtis
Geol: D M Clippinger
Metall: R Livingston
Mine Eng: Tom Jencie
Mech Supt: H A London
Prod: 11,500 tons
(mined by Isbell Constr Co.)
Mine Supt: J H Shahan
10,000-TON FLOT MILL, at
mine
Mill Supt: I B Phillips
(See N Mex, Texas)

**FLINTKOTE CO, THE
US LIME PRODUCTS DIV**
2244 Beverly Blvd
Los Angeles, Calif
Pres: I J Harvey, Jr
Gen Mgr: Kennedy Ellsworth
Asst Gen Mgr: Hardin Stephens
Gen Supt, Nev, Ariz:
W E Ellis
Res Mgr, Nev, Ariz:
J C MacDonald
Prod Mgr: L N Grindell
Res Mgr: Wm McCandish
NELSON QUARRY & PLANT,
P O Box 199, Peach Springs,
loc at Nelson, open pit, lime
Plant Supt: James Curless
MILL, Nelson
(See Calif, Nev, Tex)

FOLEY BROTHERS, INC
1111 Desert Bldg,
Salt Lake City, Utah
MINE, U₃O₈

**GIBRALTAR MINERALS
CO**
P O Box 35067, Dallas 35,
Texas
Pres: Harold Hinn
VP: Robert Hinn
Treas: Vincent Tudor
BOOT JACK MINE, P O Box
38, Kayenta, undergr, U₃O₈
Prod: 100 tons

GOLD BASIN PLACERS
c/o Jim Sherman, Box 9
Quartzsite
PLACERS, Yuma County, Au

GRIMES & BRUNSON
Tombstone
Part: W A Brunson, G K Grimes
GOLD CREEK MERCURY MINE
25 mi S of Payson on Beeline
Hwy, open pit
Prod: 10 tons
GRAY-MILL at mine site
**McGEE MINE, RATTLESNAKE
MILL**, Gila County, Hg

W B HALL
Cortez, Colorado
MINE, U₃O₈

HARBORLITE, INC
P O Box 458, Escondido,
Calif

**MARY T & SANDY No 3 MINES
& MILL**, Br 593, Superior
Supt: Marion Mognette

HILLSIDE MNG & MFG CO
Bagdad
HILLSIDE MINE, Yavapai
County, Pb, Zn
Idle

HILTON, E P
Box 1308, Tucson
**STATE OF MAINE & LONE MTN
MINES**, undergr, Pb, Ag, Au
Idle

HOLKEN MNG CO
Box 308, Winterhaven, Calif
MILL TLOS & CLEANUP MINES,
Mn
Idle

HOOPES & CO
Globe
Mgr: K L Hoopes
MINE, MILL in Gila County
limestone

**INDUSTRIAL URANIUM
CO**
273 So Main St,
Salt Lake City, Utah
Pres: Robt M Schubach
VP: Joe D Doyle
Sec-Treas: W M Burton
Mgr: Bill Doolin
NATIONAL MINE, Maricopa

County, Hg, **MOONLIGHT, &
WALTER CHIEF, SUNLIGHT
STARLIGHT MINES**, Monument
Valley, U₃O₈, V₂O₅, Cu
undergr, open pit
Prod: 275 tons

**INSPIRATION CONS
COPPER CO**
35 Broadway, New York 4, NY
Pres: P D Honeyman
Exec VP: H M Jacob
Sec-Treas: E F Wendt
Dir of Purch: A B Harris
INSPIRATION MINE, Inspiration
open pit, Cu
Prod: 16,000 tons
Gen Mgr: H C Weed
Asst Gen Mgr-Assl Sec-Assl
Treas: C G Stuns
Plant Supt: C B Ketterling
Geol: E F Reed
Mech Eng: A B seal
Elec Eng: Mark Smith
Auditor: E M Bredwell
Purch Agt: K W Whitaker
Power Plant Supt: T E Tisard
Mine Supt: J R Watts
Asst Mine Supt: T E Bilson
Gen Pit Frnt: T M Anderson
Ch Mine Eng: J L Carns

**16-000 TON LEACHING PLANT &
CONCENTRATOR**, Inspiration
Leaching Plant Supt: W D
Schrader
Ch Research Eng: A J Turk
Acid Plant Frnt: J C Davies
Concentrator Supt: K L Power
Concentrator Frnt: A L Welch
CHRISTMAS MINE, Christmas
undergr, Cu
Gen Supt: B B Whitney
Supt: N G Thompson
Gen Mine Frnt: M R Flais
Geol: J T Eastlick
(See NY)

**INTERNATIONAL
MINERALS & CHEM CORP**
CORE FELDSPAR DEPT
Old Orchard Road, Skokie, Ill
VP: Norman J Dunbeck
Gen Mgr: James E Castle
Mgr: E W Koenig
Prod Mgr: Phil Blazovic Jr
Sales Mgr: W K Burris
FELDSPAR MINE, Box 129
Kingman, surface
Supt: J W Allen
150-TON MILL, Kingman, fine
grinding
Supt: J W Allen
(See Fla, Ill, Maine, Miss, N C,
N Mex, S D, Tenn, Va, Wyo)

**INTERNATIONAL MINES
INC**
P O Box 764, Las Vegas, Nev
VP: Lila E Hickman
Sec-Treas: Henrietta Utellier
COPPER PLATE 1 & 2, Pima
County, open pit, Au, Ag
Idle

**INTERNATL SMELTING
& REFINING CO**
Miami
3,000-TON CUSTOM SMELTER
Inspiration
Supt: Henry Allen
Ore Buyer: Clifton F Smith
(See Utah)

**INTERSTATE OIL &
DEVEL CO**
P O Box 1134, Wickenburg
Gen Mgr: Verner Allen
Supt: Joe Allen
ANDERSON MINE, Ocho Come
Dist, Yavapai County, surface
U₃O₈
Idle

IRON HAT MNG CO INC
Box 347, Globe
NEW DOUGHERTY SHAFT, Gila
County, Mn
Idle

IRON TREE MNG CO
1715 Chester Ave, Bakersfield
Calif
Mgr: Albert Smith
Supt: Elmer Glenn
LITTLE BUTTE MINE, 6 mi N
of Boose, Mohave County
surface, Au
50-TON CYANIDE PLANT
Idle

ISBELL CONST CO
Box 1719, Phoenix
ESPERANZA COPPER MINE,
Box 93, Sahuarita, contract
mng for Duval Sulphur &
Potash Co
Supt: Jas F Shahan
MINE, House, open pit, Mn
Gen Mgr: W J Whitcomb
(See Idaho, Nev, Utah, Wash)

JACKSON, OTT
Congress
OCTAVE PLACERS, Yavapai
County, Au
Idle

JACKSON, WILLIAM E
Box 24, Payson
GOLD HILLS MINES, Gila
County, Cu
RED ANT MINE, Gila County,
Au, Ag
Idle

JACOBS LAKE MNG CO
Box 132, Mifflin, Wisc
PETOSKEY GROUP, Coconino,
Co, Cu
Idle

JAQUAYS MNG CORP
1319 S 19th Ave, Phoenix
Pres & Gen Mgr: D W Jaquays
VP: G A Jaquays
Asst Gen Mgr: Alvin Gerhardt
Gen Supt: Leroy Wood
**REGAL, CANADIAN MINES,
ELDORADO & VICTORY MINES**,
Box 318, Globe, 47 mi N of
Globe, undergr, asbestos
Gen Mgr: Alvin Gerhardt
Asst Gen Mgr: Leroy Wood
Gen Supt-Mine Supt: John
Kilmer
Prod: 150 tons rock, 15 tons
asbestos mill ore
40-TON GRAY MILL, Globe
Mill Supt: Ray H Davis

JOLYN ASSOCIATES
Box 1109, Wickenburg
**GLOBE MANGANESE, WEST
MINES**, Gila County, Mn
Idle

JEZEBEL MINE
4625 E 14th Street,
Tucson 13
Pres: J E Thornton
MINE, Sells Star Route, Tucson,
mine loc, Fresnal Mng Dist,
15 mi E of Sells, undergr,
scheelite
Gen Mgr: J E Thornton
Gen Supt: E A Thornton
Geol: M E Thornton
20-TON GRAY MILL, Tucson
Under devel

JOT MNG CO
Oklahoma City, Okla
MINE, Ketchikan Dist, U₃O₈
(Formerly Kendrick Bay Mng Co)
(See Okla)

**K B R MNG & DEVEL
CORP, INC**
Box 198, Yarnall
Pres & Purch Agt: Jerald P
Kolar
VP: Claude Brittain
Sec: Philomene Brittain
Treas: E Kolar
**STAR OF ARIZONA, ELSIE'S
JACK POT #1 & #2 MINES**, Kolar
Group, undergr, Au, Ag, Cu, Pb
Gen Mgr: J P Kolar
Idle

KACHINA URANIUM INC
6345 N 16th St, Phoenix
MINE, U₃O₈

**KENNECOTT COPPER
CORP, RAY MINES DIV**
Ray
Gen Mgr: A P Morris
Asst Gen Mgr: R B Young
Compt: C R Knous
Purch Agt: N E Ogger
Adm Asst: C L Hoyt
Dir Indus Rel: E V Morgan
Safety Eng: C S Fleming
Ind Eng: J M Hood
Dir Quality Constr:
L E Mulholland
RAY MINES, open pit, Cu, Ag
Gen Mine Supt: J C Van deWater
Prod Supt: R J Winkie
Geol: R A Meis
Metall Supt: A L Dickerson

Ch Eng: H W Bishop
Prod: 15,500 tons
REDUCTION PLANT, Hayden
15,500-TON FLOT MILL, Hayden
25 mi SE of Ray
Mine Supt: A T Shulane
REDUCTION PLANT, Hayden
Reduction Supt: F O Woodruff
Maint Supt: J E Stocher
Plant Eng: J A Cooper
SMELTER, Hayden, reverberatory
Supt: W M Winn
(See Nev, N Mex, NY, Utah)

**KENNECOTT COPPER
CORP, SAFFORD PRO-
JECT**
Box 30, R 1, Safford
LONESTAR MINE, Safford,
under devel
Mng Engr: Sam K Smyth
Geol: Amana Cook
(See Nev, N Mex, Utah)

KENT MINES, INC
Yavapai County
Au, Ag, Pb

KERN COUNTY LAND CO
2624 N 1st Ave, Tucson
Mgr, Minerals Dept:
Wm T Griswold
Ch Minerals Geol: Wayne K
Wallace
(See Calif, Idaho, Utah)

**KERR-McGEE OIL
INDUST, INC**
NAVAJO URANIUM DIV
Box 608, Shiprock, N Mex
COVE MINE, Cove, undergr,
U₃O₈, V₂O₅
Gen Mgr: C L Wise
Geol: Billy Stevens
Mine Supt: Jack London
Mine Frnt: Vernon Willdon
Prod: 250 tons
**MEHA GAP AND SIMPSON #1
MINES**, Apache County,
U₃O₈
(See Colo, N Mex, Okla, Wyo)

KIMBLE, THOMAS
1310 Silver City Heights
Silver City, N Mex
**GLOBE MANGANESE, STALLO
& MOODY MINES**, Gila County,
Mn
Idle

**MARCY-SHENANDOAH
CORP**
Jarvis Bldg, Durango, Colo
Pres & Gen Mgr: S Stokes
Tomlin Jr
VP & Geol: E M Barge
Sec: R M Schell
Treas: Robert R Snodgrass
JACK DANIELS MINE, Cameron
open pit U₃O₈
Idle
(See Colo, Utah)

**MIAMI COPPER CO
(COPPER CITIES DIV)**
61 Broadway, New York &
NY
Pres: E H Westlake
VP: J H Follitt
Sec-Treas: John Greenburgh
MIAMI COPPER COMPANY,
Box 160
VP & Gen Mgr: B R Coll
Asst Gen Mgr: J H Gray
Gen Supt: C C Webb
Geol: W W Himmson
Mech Supt: R P Hughes
Met: J J Bean
Elec Eng: A T Wetterblad
Mine Supt: E G Williams
Asst Mine Supt: W F Sloan
Mine Eng: J B Fletcher
Prod: 6,500 tons
13,000-TON MILL, Miami
Mill Supt: R L Mountjoy
Assay: G R Warren
(See NY)

**SAN MANUEL COPPER
CORP**
Box 5417, San Manuel
Pres: W F Goss
VP: F H Buchalla
J F Buchanan
Sec: F E Rinehart
Treas: W F Schmid
SAN MANUEL MINE, Cu, Mo
Ag, Au, undergr
Gen Mgr: F H Buchalla
Asst Gen Mgr: J F Buchanan
Piling Engr: J D Pelletier
Geol: L A Thomas

Mech Supt: G A Bilson
Elec Eng: J W Oann
Mine Supt: C L Pillar
Asst Mine Supt: E K Staley
Gen Mngt: Tami C F Cigliana
Chf Mine Engr: Ray Tobie
Prod: 33,000 tons
33,000-TON FLOT MILL
Mill Supt: E V Given
Asst Mill Supt: N K Burke
Prod: 1,500,000, 000

REVERB SMELT
Supt: R C Wilson
Asst Supt: John Colham

KING & CRAWFORD
Box 88, Vicksburg
Pres: Clarence King
YUMA COPPER MINE, Yuma
County, Cu
Under devel

KING MIDAS MINES, INC
P O Box 410, Oatman
Pres: W E Hittman
VP: Gen Mgr: James H
McCarthy
Sec-Treas: Frances H Hittman
ALTA & IDA MINES, Oatman
Dist, Mohave County,
undergr, Au, Ag
Mine Supt: F L Gilkey
Under devel

KLANER & ASSOC
325 E Cornsade Rd,
Santa Fe, N Mex
BOYD TISI MINE, Cameron
open pit, U3O8
Gen Mgr-Mine Supt: M W
Pullack
Idle
(See N Mex)

KNOX-ARIZONA
COPPER MNG CORP
8867 Ladue Rd, St Louis 24
Mo
Pres: Wm A Knox
VP: Tom Keyes
Sec-Treas: Wm A Knox
COPPER MT MIND, Ajo
Under devel

KOFA QUEEN MNG CO
Box 1782, Yuma
Gen Engr & Purch Agt: G H Fox
Sec: Betty J Fox
Treas: Betty J Fox
Geol: A B Sheris
QUEEN BEE-JEANNE MINES,
NUGGETT, Yuma County, Mo,
Au, Pb, Ag, undergr, open pit
placer
Gen Supt: Clay Ramsey
Mech Engr: Hewlett Miller
Constr Engr: Walter Parker
Mine Frmt: Albert Phillips

KYLE ASBESTOS MINES
OF ARIZ
Box 302, Globe
SLOAN CREEK, LUCKYSTRIKE
MINE
Op: Roger Q Kyle

L & A MINING CO
507 E Willetta St, Phoenix
MORNING STAR NO 1, Yavapai
County, Mn
Idle

LAW, RALPH
Agulla
BLACK BART NO 1, LUCKY
NO 1 MINES, Mo
Idle

LEON, MILTON
208 Wright Bldg., Tulsa 3
Okl

UNCLE SAM MINE, Box 659
Nogales, 3 mi NE of Nogales
undergr, Au, Ag, Pb
Under devel

LEROY MINE
Cochise count
MINE, Cochise County, undergr
& surface, Pb, Ag
Own: Mrs Thelma Bean, Box 5
Doe Caberton
Idle

LETOURNEAU ASBESTOS
CORP
c/o Sol Hulegus, 1-38-27th St
Fairlawn

LETOURNEAU MINE, Oila
County, Asbestos
Idle

LEWISOHN COPPER CORP
PO Box 2276, Tucson
Pres: Richard E Chilton
VP: Boyd M Morse
PEACH MINE, Helvetia, 35 mi
SE of Tucson in Santa Rita Mts
open pit, Cu
Idle
KING EXILE MINE, Helvetia
undergr, Cu

LUCKY STOP MNG CO
Young Rt, Globe
Partnership: Johnnie Brunson
William Brunson
Ed Conway
Hugh Nichols

LUCKY STOP MINE, Oila
County, undergr, U3O8
Mgr & Mine Supt: Johnnie
Brunson
Idle

P H LUND ENGINEERING
CO
3411 N 14th Place, Phoenix
Pres: Guy J Stampff
VP: Emmet R Feighner
Sec-Treas: P H Lund
LUCKY HORSE SHOE GROUP
Gila County, open pit
Gen Mgr: Guy J Stampff
Mine Eng & Geol: P H Lund

JAMES W LYNCH
General Delivery, Cameron
MINE, U3O8

MAGMA COPPER CO
Box 37, Superior
Pres & Gen Mgr: J P Goss
Asst Gen Mgr: J F Buchanan
VP & Sec: Roy Bonebrake
Treas: W F Schmid
Purch Agt: Ray Medlock
MAGMA MINE, Superior,
undergr, Cu, Au, Ag
Gen Mgr: Darrell Garner
Gen Supt: G L Augustadi
Geol: R N Webster
Mine Supt: Cecil Tomerlin
Asst Mine Supt: H S Steel
Mine Eng: B Van Voorhis
Prod: 1,500 tons
1,500-TON FLOT MILL,
Superior
Supt: Halder Rex
Frmt: M C Cookaley
Assay: Martin Harris
REVERB SMELTER, Superior
Supt: E J Caldwell
Asst Supt: C L Soule
Prod: 48,000, 000 lbs yrlly

MARSH CREEK MNG CORP
844 E Van Buren, Phoenix
Pres: Alice B Mullin
Agent: C W Northwine
(See Idaho)

MARSTELLER, GROVER
Nogales
MINE PRIETA MINE, Santa
Crus County, open cut, Mn
Idle

MARVEL MNG CO
368 S 5th E, Salt Lake City
Pres: J A Minton
VP: D E Harrison
COLUMBIA MINE, Wenden,
Ariz., Uranium Mineral Belt
various U3O8 properties
under devel

MERCURIA MINING CO
%Oliver Brunson, Tonto Basin
Pres: H Nichols
Sec: J Savoy
Treas: G Brunson
MINE, undergr, Hg

MASSINGILL, C E
2083 W 1st St, Mesa
MINE, Spring Creek Dist, Oila
County, Barite
Idle

MCCARRELL
CH McCarrell, Chambers
CHETO MINE, Bentonite, pit
Apache County

MCELRAITH, FRANK
Rt 6, Box 9, Tucson
PROSPERITY, BLUE COPPER
MINES, Pinal County, Cu

MC FARLAND &
HULLINGER
Box 239, Tooele, Utah
Own: F G McFarland &

S R Hullinger
JOHNSON CAMP MINE, Dragon
Supt: W D Nelson
Frmt: Gunther Stoffers, Cu-Zn
Prod: 180 tons
ELGIN MINE, Box 811, Tucson 9
Pima Mng Dist, open pit, Cu
Supt: W D Nelson
Prod: 180 tons
Gen Supt: William D Nelson
Geol & Mine Eng: Gerald W
Irwia
Prod: 90 tons
400-TON MILL, Sahuarita
Supt: M L Erickson
(See Utah)

MCLEOD & MILLER
Mayer
BURMEISTER MINE, Yavapai
County, surface, Mn
Idle

MCNEEL, NOEL
Chambers Store, Ray
STEAMBOAT, STEAMBOAT
APPROACH, LUCKY STAR
MINES, Pinal County, Mn
Idle

METATE ASBESTOS
CORP
Box 11, Globe
Pres, Gen Mgr & Purch Agt:
Jack L Neal
Asst Gen Mgr & Sec:
Chas Ross Neal
LUCKY SEVEN AND EMSCO
MINES, San Carlos Apache
Indian Reservation, undergr
asbestos
Asst Supt: Harvey Collins
Mill

MIDWEST RESOURCES
1505 N 15th Ave, Phoenix
Pres-Gen Mgr: Wayne Johnson
MINE, Ournes Dist, Mohave
County, 4 mi S of Wickieup, Mo
Pb

50-TON JFO PLANT
Idle

MINES CONTRACTING CO
c/o Ike Kusisto, Wickenburg
MOHAVE MNG & MLG CO
Box 66, Wickenburg
Pres: H F Lynn
VP: G S Jordan
Sec & Treas: Frank Kohler
Mgr: W R Easley
BOX GARDEN MINE, Yavapai
open pit, Mn
Met: T Saunders
Idle

350-TON FLOR & HEAVY-MED
MILL, tables, Box Canyon,
Yavapai County
Idle

Mill Supt: Geo Johnson
Assayer: Lyle Schwader
SINTERING PLANT, Yavapai
County
Mgr: Bob Monahan

MOORES, CHARLES F
Box 491, Globe
LAST CHANCE MINE, Pinal
County, Pb, Zn
MONITOR GROUP, Pinal County
Au, Ag
Idle

MULLER MANGANESE
Box 705, Wilcox
AMERICAN 20 MINE, Luna Co,
N Mex, Mn
(See N Mex)

MURCHISON VENTURES
INC
PO Box 977, Flagstaff
MINE, U3O8

NASH MINES
406 Nash Bldg., Austin, Tex
Own: Jas P Nash
BONANZA, HOLLAND, KANSAS,
ESTELLA, BELMONT, MAINE,
NEW YORK, INDIANA
DUQUESNE, & EMPIRE MINES,
Patagonia mng dist
Idle

NASH & MCFARLAND
408 Nash Bldg, Austin, Tex
FLUX MINE, 10 mi from
Patagonia, undergr, Pb, Zn, Ag
Gen Mgr: E W McFarland
Nogales
200-TON TRENCH MILL, 3 mi
from mine

NAVAJO TRIBE
Box 148, Window Rock
Chmn: Paul Jones
MINES, undergr & open pit
U3O8

NEW APEX GOLD MINES
Box 1055, Hayden
Own: B C Velasco
Treas: Consuelo P Velasco
MINES, undergr, Au, Ag, Cu
Under devel

NORART MINERALS LTD
Box 217, Duncan
Pres: J R Mac Brien
Sec: W E Fike
Treas: W R Fike
BEARD MINE, 17 mi N of
Duncan in Steeple Rock
Mining Dist of Grant Co, New Mex
Au, Ag, Cu, Pb
Mine Eng: T Beard
Prod: 50 tons daily
FLO-GRAVE MILL at mine
Prod: 50 tons daily
Mill supt: J Mooney
RETORT, shipping concentrates
not estab

NORGAARD, INAR
P O Box 394, Kellogg, Idaho
P O Box 71, Mexican Hat
Utah
MINE, U3O8

OLD GOLD MNG CO
Box 368, Sells
Own & Op: Maurice Hedderman
ALLISON MINE, Sells, undergr
Au, Si, Ag
Prod: 20 tons

ONEIDA MINING CORP
1804 Farmer Ave., Tempe
Pres: Thomas E Bolich
VP: Allison A Durey
Sec: Chauncey A Brion
ONEIDA MINE, 30 mi S Payson
Surface, Hg
Gen Mgr: Thomas E Bolich
Met: Chauncey A Brion
Prod: 40 tons
4-FLASK RETORT REFINERY,
at mine
Supt: Chauncey A Brion

PARAMOUNT MNG CORP
P O Box 4577, Tucson
Pres: I Icove
VP: S Makalla
Sec: J Sonnenblick
MINE, Cortland, Cu
Geol: C Spaulding
Met: S Makalla
Chem: G H Dixon
Mine Supt: & Gen Mgr: W Ward
Prod: 3 1/2 tons daily
LEACHING UNDER GR PLAST
PATTERSON, C C
Box 174, Chileride
CHAMPION MINE, Mohave
County, Pb, Zn
DOWNIE LEASE, EMERALD
ISLE MINE, Mohave County, Co
Pb, Zn
Idle

PAUL LIME PLANT INC
Paul Spur, Rural Stn,
Douglas
Pres & Gen Mgr: Alfred Paul,
Jr.

VP: Virginia Holland Paul
Sec-Treas & Asst Gen Mgr:
Howard E Ames Jr
PAUL LIME PLANT, Paul Spur
open pit, lime rock
Supt: C T Blish
Prod: 800 tons
LIME KILNS, rotary kilns,
crushing & grinding & screen-
ing plant

PERLITE INDUSTRIES
OF ARIZONA
2123 E Henshaw Rd, Phoenix
Pres: Lewis Williams
VP: Reagan Williams
Sec-Treas: Buster Williams
ADAMS MINE, Superior, open
pit, perlite
Gen Mgr: Buster Williams
Supt: Harley Miller
Prod: 80 tons
MILL, Superior, crushing
Supt: Harley Miller

PERRY, RAYMOND
Rt 1, Box 27, Salome
BLACK BEAUTY MINE & MILL
Yuma County, Mo
Idle

PHELPS DODGE CORP
WESTERN OPERATIONS

Douglas
WESTERN GEN OFFICES
VP & Gen Mgr, Western
Oper: W C Lawson
Asst Gen Mgr: J B Pullen
Office Mgr: H E Moore
Dir, Labor Rel: W J Uren
Chf Mech Engr: J H Davis, Jr.
Geophys Research: E E Maillot
Gen Aud: G A Swanson
Asst Gen Purch Agt: K A Ables
West Traffic Agt: A C Bacon
MORENCI BRANCH, Morenci
open pit mines, Cu, Au, Ag, Mo
concentrator & Smelter
NEW CORNELIA BRANCH, Ajo
Mgr: J A Lentz
open pit mines, Cu, Au, Ag
concentrator & Smelter
Mgr: J A Briggs
COOPERATIVE MERC CO, Ajo
Mgr: H L Smith
COPPER QUEEN BRANCH,
Bisbee, undergr, & open pit
mines, Cu, Au, Ag, concentrator
Mgr: W W Little
DOUGLAS REDUC WKS, Douglas
Smelter
Mgr: W W Little
Supt: M G Fowler
Greater Arrowhead, N of
Safford,
under devel
PHELPS DODGE MERC CO
Bisbee, Clifton, Douglas and
Morenci
Gen Mgr: H L Smith, Douglas
(See N Mex, N Y, Tex)

PHILLIPS ASBESTOS
MINE
Globe
Mgr: Guy Phillips
MINE, Gila County, surface,
undergr, asbestos
MILL

PIMA MNG CO
P O Box 7187, Tucson
Pres: H T Mudd
VP: P W Allen, A R Thomas
A D Christenson, H S Nye
Sec: D P Evans
Treas: C W Six
Compt: L W Smith
Purch Agt: H E Eckstein
Office Mgr: D N Tremper
PIMA MINE, 20 mi SW of
Tucson, open pit, Cu
Gen Mgr: P W Allen
Res Mgr: E D Spaulding
Asst Res Mgr: A A Friedman
Ch Eng: J F Oik
Geol: J A Journey
Safety Eng: A H Monroe
Met R W Herkard
Elect Supt: A G Beebower
Mine Supt: R E Thummond
Mine Frmt: D N Rich
Mine Eng: M D Martin
Ore Eng: Wm Pili
Pers Div: F A Rich
Prod: 4,000 tons
3,500-TON FLOT MILL, at
mine
Mill Supt: G A Komadina
Asst Mill Supt: J A Beashear
Mill Frmt: W H Irby
Assay: P Flores
(See Calif.)

ROY CO, THE
c/o Louis Sirotti, Nogales
PITTSBURGH GRP, Santa Cruz
County, Cu
Idle

POWER J F
Pispey, Calif
CIBOLA #7 MINE, Yuma County
surface, undergr, Mn
Mgr: C J Henshaw
Idle

FW MANGANESE MNG
& MLG CO
Box 61, Blythe, Calif.
CIADLA MINE NO 3, Yuma
County, Mn
Idle

RAMSEY, J L
Vicksburg
RAMSEY MINE, Yuma County
Mn, Pb, Ag
Idle

RAH-REX COIL CO
Bert Smith, Valentine
COPPER GIANT, Mohave
County, Cu
Idle

RARE METALS CORP OF AMERICA
1st Security Bldg, Salt Lake City 11, Utah
300-TON ACID-LEACH MILL, Yuba City
Mill Supt: S M Runke
Asst Mill Supt: L O Davis
Mill Frm: L W Mead
Met: D E LeMaire
Chemist: G L Butt
(See Idaho, N Mex, Utah)

RENG, NORMAN M
Box 34, Dragon
KEYSTONE MINE, near Johnson Camp, Cochise County, surface, undergr, Cu
Idle

REYMERT EXT SILVER MINES
Box 521, Superior
REYMERT MINE, Pinal County, Ariz, Ag
Idle

RICO MNG CO
Agua
Mgt: P D Evans
IRON CHANCELLOR MINE
Yavapai County, Fe
Idle

ROYAL INVESTMENTS INC
1804 S 9th St, Las Vegas, Nev
Pres: Burton W Hancock
VP: Mildred Hancock, Alfred Elliott
Sec: Frank E Hubert Jr
Treas: Herman Radner
SCOTT-WEAVER, Yuma County, Cu, open pit, Under devel

SALERO-SANTA RITA MINING & LEASING CO
Box 725, Patagonia
Own: V L Rutherford
VP & Mgr: Jack Rutherford
SALERO MINES, Salero, undergr, Ag, Pb, Cu, Au, Zn
Idle

SANTA CRUZ COPPER CO
1211 E 9th St, Tucson
Pres: D M Stranahan
VP: Norman B Davis
Sec: Victor H Verity
Treas: A K Barranco
VOLCANO & SUNNYSIDE MINES, Patagonia, Cu
Idle
SAN MIGUEL MINE, Salome
Idle

SANTA LUCIA
Arivaca
Pres: L B Shirle, 919 Wells St
Fort Wayne, Ind
SANTA LUCIA MINES, 6 mi W Arivaca, surface, Cu
Idle

SCHEMMER, FRED D
Drawer 827, Prescott
COMMERCIAL MINE, Copper Basin Dist, Yavapai County, 7 mi N of Kirkland Jct, undergr, Cu

SCHOLZ, E A & CAZIER, J H
1533 Black Mt Rd
Hillsborough, Calif
COPPER KING MINE, 7 mi S of Bagdad, undergr, Zn, Cu
Idle

SELLS, CATO
P O Box 253, Farmington
N Mex
SELLS MONUMENT #3 MINE
U₃O₈

SENA MINING CO
112 Park St, Kingman
MINE, Pegmatites
Idle

SEVIERS MINERALS CO
William R Roberishaw
7710 Huntingbird Lane
Scottsdale
Idle

SHANNON MNG CO (PERU MNG CO)
Box 308, Silver City, N Mex
SHANNON GROUP, Cochise County, Au, Ag
Idle

SHATTUCK DENN MNG CORP
120 Broadway, New York 5, N Y
Pres: Thomas Hardon
VP: Thomas V Toszi
Asst VP: D M Kentro
T W Newell
Sec-Treas: John A Moss
IRON KING MINE, Humboldt, undergr, Zn, Pb, Au, Ag, Cu
Gen Mgr: D M Kentro
Met Eng: A N Jeffers
Chf Eng: L Bombardieri
Mech Eng: B Waples Jr
Chf Clk: W Richardson
Purch Agt: J C MacGregor
Mast Mech: Joe Kachnic
Mine Supt: Elmer Tomkinson
Asst Mine Supt: Claude Apperson
Mine Frm: R L Hurd
R J Williams
1,100-TON FLOT MILL, at mine
Supt: Thomas L Hoskins
Mill Frm: Chas Jones
Assay: W Stallier
(See Colo, N Y, Utah)

SIERRA COBRE MNG CO
1510 N Wiltshire Dr, Phoenix
CERA COBRE MINE, Maricopa Co
Idle

SIERRITA MNG CO
Donald R McGee, Ruby Star Rd
Box 25, Tucson
GOLDEN FLEECE MINE, Pima County, Cu
Idle

SISKON CORP
422 Gazette Bldg, Box 889
Reno, Nev
OLD RELIABLE MINE, Pinal County, Cu
Idle

SITTON, F A
830 N Central, Phoenix
AMERICAN MINE, Mohave County, Mn
KAHAR NO 4, LONE WOLF MINES, Maricopa County, Mn
Idle

SITTON & SITTON
Dove Creek, Colo and Phoenix, Ariz
Pres: F A Sitton
VP: M Sitton
DELUX, undergr, U₃O₈, V₂O₅
Prod: 30 tons daily

SMITH, AS & PETERSON F O
Kingman
WHITE ELEPHANT MINE
Mohave County, Silica
Idle

H C SMITH
Skyline Drive Box 347, Globe
MINE, U₃O₈

SMITH, VERNON
York, Pa
WALNUT CREEK, TONY MESA & OTHER MINES, Gila County, Asbestos
Under Devel

SOUTHERN COPPER MNG CO
(Insee, W S (Bud) Talcott)
Box 194, Arivaca
SANTO NINO MINE, Santa Cruz County, undergr, Cu, Mo
Idle

SOUTHWEST MINES CONTR CO
Box 1041, Prescott
Gen Mgr: Joe Ward
GREAT SCOT MINE, 19 mi SE of Prescott, undergr, Pb, Zn, Au, Ag
WHITE PEARL, 7 mi S of Prescott, undergr, WO₃
Idle

SOUTHWEST MNG INDUSTRIES
1000 N Mt, Tucson
Pres: H B Brauchla
VP: Hubert Layne
Purch Agt: H Clyde Davis
EL ORO, ORO BLANCO
Idle

SOUTHWESTERN IRON & STEEL INDUSTRIES
1016 Valley National Bank Bldg
Tucson
OMEGA IRON PLACER DEPOSIT
44 mi NW of Tucson, Pinal County
Idle

STANDARD URANIUM CORP
Payson
COPPER KING MINE, Gila County, Cu
(See Utah & Colo)
Idle

STEINBERGER DRILLING CO
Cameron
Pres: H Steinberger
ALYCE TOLINO, JULIA SEMOLLIE & JUAN HORSE MINES, Cameron, open pit, U₃O₈

STEWART, CHAS
Arivaca
MOLY-O MINE, 3 1/2 mi N of Arivaca, Pima County, Pb, Ag
Idle

STEWART, JACK
800 N Central, Phoenix
BLACK DIAMOND, JOHN JR GRP, Yuma County, Mn
Idle

JAMES STEWART CONST CO
411 N Central, Phoenix
Supt: Chas H Sulter
CHARLESTON MINE, Cochise County, open pit, Pb, Zn, Sericite
Idle, at mine

STOVAL MANGANESE MNG CO
950 W Van Buren St, Box 653
Phoenix
LS&A MINE, Superior, Pinal County, undergr, Mn
Mine Supt: O K Mills
Idle

STRONG & HARRIS, INC
4722 E Scarlett, Tucson
CORONADO MINE, Cochise County, Cu
GOLD HILL MINE, 11 mi SW of Tucson, open cut, Pima County
Cu
Idle
SAGINAW MINE, Pima County
Cu
Idle

SUNRISE MNG CO
Drawer 37-B, Sahaurita
Pres: A F Simons
Gen Mgr: G W Irwin
GLOVE MINE, 8 mi E of Amado in Santa Rita Mts, undergr, Pb, Ag, Zn
Mine Supt: Alfred M Durazo
Prod: 15 to 25 tons
PAYMASTER MINE, Under dev
(See Tex)

TATE MINE DEVEL & SUPPLY CO
3438 N Kelvin Blvd, Tucson
(See N Mex)

OTIS B TAYLOR
PO Box 723, Benson
MINE, U₃O₈

TEJON MINE LSG & DEV CO
Box 603, Tombstone
Own: William Ward
TEJON MINE, 18 mi NE of Tombstone, undergr, Cu, Pb, Au, Ag
Idle

TOMBSTONE DEVEL CO
PROMPTER-OREGON MINE
3 1/2 mi S of Tombstone, Cochise County, undergr, Mn
Idle

TONTO MINES
Payson
BEELINE MINE, RED TOP IMINE, TONTO MINE, 30 mi SW Payson, undergr & surface
Ng

Gen Mgr: C O Carlson
Prod: 50 tons
60-TON GRAV MILL, 2 mi from mine
Idle
Mill Supt: C O Carlson

TRANSARIZONA RESOURCES, INC
917 E Fort Lowell Rd
Tucson
(See N Mex)

TRANS-ARIZONA RESOURCES, INC
201 E Fourth St
Casa Grande
Mgr: George Freeman
MINE, open pit
500-TON MILL
Under devel

L L TRAVIS
PO Box 1632, Longview
Texas
MINE, U₃O₈

TRUJILLO & NELSON MNG CO
Box 145, Winslow
MILLSITE, GRP, Coconino County, Mn
Idle

TUCSON PERLITE, INC
4438 N Hwy Drive, Tucson
PROCESSING PLANT, Jaynes

UNIVERSAL COPPER CORP
2308 E 17th St, Tucson
Pres: James E Gaylor
ALICE MINE, Troy, undergr, Cu, Pb, Au
Under devel
TWIN STAR INDUSTRIES INC
1111 S Congress, Austin, Tex
Pres: W B Pratt
VP: John S McNabb, Jr
WHITE CLIFF MINE, open pit
Sedimentary earth
Under devel
TWIN STAR MINE, 1820 E Hampton, Tucson, pumice, talc
guano
Gen Mgr: C Neil Vogel
Under devel
(See Tex, N D)

TWIN STATES URANIUM CO, INC
Box 722, Winslow
Pres: B B Armstrong
Sec: M J O'Hara
Treas: M J O'Hara
MINE, open pit
Under devel

UNION GYPSUM CO
Winkelman
UNION GYPSUM MINE, Pinal County, surface, gypsum
Mgr: Archie Lee

U S CONSOL MNG CO
Box 473, Prescott
MINOR GRP, Yavapai County, Cu
Idle

U S GUANO CORP
Box 388, Kingman
Pres & Treas: Frank E Ruben
VP: Samuel Neisman
VP: Ben Potts
Sec: M F Crompton
Asst Sec: J Chilson
BAT CAVES, Grand Canyon
Gen Mgr: Varley Crompton
Gen Supt: B A Freiday
Prod: 20 tons

UNITED STATES SMELTING, REFINING & MNG CO
P O Box 2137
75 Federal St, Boston, Mass
Pres: F S Mulock
GOLD MINE, Mohave County
Idle
(See Alaska, Mass, N Mex, Utah)

UTAH SOUTHERN OIL CO
1825 First Nat'l Bank Bldg
Denver 2, Colo
MINE, U₃O₈

VANADIUM CORP OF AMERICA
470 Lexington Ave, New York 17, N Y
Pres: W C Keeley
Sec: Denton Schriber

Treas: L C Miller
DURANGO PLANT & RELATED MINES, Monument Valley, undergr, U₃O₈, V₂O₅
Gen Mgr: Fred A Drinker
Mech Eng: C T Newland
Mast Mech: Dale Prior
Mine Supt: R L Anderson
Chf Chem: Wayne Lowrey
Mgr: Land Expl & ore Buying
P L Edwards
Mines Auditor: D Ornelia
Purch Agt: R S Schrader
Mgr Safety-Permit: J A Maxwell
Safety Eng: R L Yeager
Mine Supt: R L Anderson
600-TON MILL, Durango
Mill Supt: L A Daniele
Asst Mill Supt: R Newland
(See Colo, N Mex, N Y)

VARIOUS METALS CO
Box 72, Heber
Own: John C Patrick
RAINBOW MINING GROUP, 13 mi SW Heber, undergr, surface, Mn
Mine Supt: W P Miller, Lessee
Prod: 100 tons
20-TON FLOT MILL, at mine
Mill Supt: W P Miller
Idle

VESTA ASBESTOS MINES INC
2243 W Mulberry Dr, Phoenix
Pres: Pat Foley
Idle

VIA DEVELOPMENT CORP
Box 4266, Santa Fe, N Mex
Pres: C W Via
VP: H H Via
Sec-Treas: Dale Trieder
MANGANESE MINE, Globe, undergr
Under devel
ASBESTOS MINE (leased to Reynolds Falls Asbestos, Inc)
Phoenix)
Under gr
Idle
BLUE MOON MINE, S of Globe, undergr, open pit, Au, Cu
Idle
(See N Mex)

WALNUT GULCH MILL
Tombstone
Partnership:
MINE, undergr, Mn
Gen Mgr: H Hughes
Prod: 20 tons daily
FLOT MILL, S of Tombstone
Mill Supt: H Hughes
Prod: 50 tons of Mn daily
WEEKS, C F
P O Box 288, Kingman
WHITE SPAR MINE, Mohave County, Silica

WELLS CARGO INC
PO Box 430, Las Vegas, Nev
MINE, U₃O₈

WESTERN GOLD & URANIUM INC
Box 95, Grand Canyon
Chmn of Bd: Ralph G Brown
Pres: Russell L Richards
Sec: Barone Backus
Treas: J K Pakler
Mng Dir: C E Prior
Chmn of Bd: Ralph G Brown
ORPHAN MINE, Grand Canyon
undergr, U₃O₈
Ch Geol: Max E Kofford
Met: Jack K Howell
Mine Supt: Maurice Castagne
Mine Eng: Robert Hartmann
Prod: 100 tons
(See Colo, Utah)

WESTERN PACIFIC MNG CO, THE
Box 163, Peach Springs
WESTERN PACIFIC MINES
Coconino & Mohave Counties, Cu
Idle

WHITING, H M
PO Box 871, Wickenburg
DESERT ROSE, KNABE NO 6 ML TLOS, LITTLE HORN, BLACK SUE MINES, Maricopa County, Mn
Idle

WILKERSON, J L & CO
Crown King
Mgr: Ed W Carls
SAVOY MINE in Yavapai County
Pb, Ag
Under devel

Arkansas - California

C D WILSON, ESTATE OF

Box 104, Sahuarita
Executive Park, Tucson
MARAGANETTE MINE, Pima
County, open pit, Ca, Ag, Au
Prod: 250 tons per week

WINN, LOUIS
987 Broad St, Globe
IRON MINE, KENO, MAGNET
MINES, Gila County, Mo
Idia

WILLIAM WITTMAYER
Durango, Colo
MINE, U₃O₈

WOLTMANN, T C
Box 104, Picochito
NO 13 CLAIM MINE, 30 mi E
Casa Grande, surface, Cu
Prod: 3-10 tons
SUNSET, 8 mi S of Picochito
Peach, Co, Ag, Au
Under devel

WOODSON EXPLOR CO

Cameron
Supt: R M Cammell
JACK HUSON GRP, near
Cameron, Coconino County
surface, U₃O₈
Idia

ZINKL, ANDY
Tonto Basin
PACKARD MINE & MILL, Gila
County, Ca₂
Idia

ZODIAC URANIUM INC

510 Felt Bldg, Salt Lake City
Utah
Pres: Leo G Bateman
VP: M G White
Sec: Paul Jones
Treas: Gladys B Harvey
NAVAJO INDIAN RESERVATION
MINE, surface, U₃O₈
Geol: Leland J Davis
(See Mont)

ARKANSAS

ALUMINUM CO OF AMERICA (BAW MATERIALS DIV)

1501 Alcoa Bldg, Pittsburgh
15, Pa
Pres: F L Magee
VP: L Litchfield Jr
Sec: A M Hunt
Treas: E B Wilber
Gen Purch Agt: R O Keefe
Div Gen Mgr: Geo W Streepy
BAUXITE, Bauxite, open pit
Bauxite
Works Mgr: J T Watters
Asst Works Mgr: H W Rucker
Mine Supt: J E Cole
Geol: G C McBride
Mech Eng: M F Garlington
Mng Eng: R L Schell
Prod: 3,000 tons
(See Ill, Ky, Pa)

AMERICAN CYANAMID CO

Box 246, Benton
UAPAW MINE, 2 mi N
Bauxite, surface, bauxite
Mgr: R H Harris
Mgr, Bauxite Mgr:
A W Montgomery
MILL, Benton
(See Fla, Ga, NY, Va)

ARKANSAS GYPSUM CO

Murfreesboro
Pres & Gen Mgr: Vernon B
Lewis
GYPSUM MINE, Murfreesboro
undergr, surface

ARKANSAS MNG & EXPLOR CO

Batesville
MINES, N of Batesville, open
pit, Mn
Idia

ARKHOLA SAND & GRAVEL CO

323 Merchants National
Bank Bldg, Ft Smith
Supt: G Abercrombie
(See Okla)

BAXTER, LEONARD

Cushman
MINES, Cushman, open pit, Mn
Idia

CAMPBELL BAUXITE CO

Sweet Home
Pres: J Clyde Campbell
PROCESSING PLANT, 1 1/2
mi SE of Little Rock, Bauxite

HARGUS MNG CO

Box 150, Batesville
Pres W H Hargus
SMITH MINE, Cushman & Men
open pit, Mn
Mine Supt: Will Hargus, Jr.
Pres: 3 tons
GRAY MILL, Cushman
Idia

HOUSE, H L

Batesville
MINE, Independence County, Mo
Idia

LA FAY, GUS W

283 E Chestnut, Batesville
Pres: Gus La Fay
Sec: Jean La Fay
MINE, open pit, Mn.
Assayer, B Williams
Prod: 5-10 tons
Idia

MAGNET COVE BARIUM CORP

Box 5584, Houston 5, Tex
MINE, Magnet Cove, undergr
bauxite
Gen Mgr: James S Starks
Mine Supt: Marvin Verser
Ch Eng: Fred Scharf
Met: B C Hardinge
Geol: Harry Metcalf
Mine Pres: Roy York
Prod: 1,200 tons
1,200 TON FLOT MILL
Machinery
Supt: E H Spraggins
(See Fla, Mo, Nev, Tex, Wyo)

MILLER & MC GEE

Batesville
MINES, N of Batesville, open
pit, undergr, Mn
Idia

MINERAL SALE CO

Box 1061, Batesville
MINE, Mn
Idia

NATL LEAD CO

BAROID DIV
P O Box 358, Malvern
Gen Supt: E C Farrell
Asst Supt: W A Halbert
Mine Supt: A J Higgins
Mine Pres: James E Baird
MINE, Malvern, open pit, barite
Prod: 1,500 tons
1,500-TON FLOT MILL, 10 mi
N of Malvern
Mill Supt: W F Brooks
Asst Mill Supt: V C Hays
Mill Pres: J O Wallace
(See Calif, Colo, La, Mont, Mo,
Nev, N.Y., Tenn, Tex, Wyo)

NORTON CO

1 New Bond St, Worcester 6
Mass
Pres: Milton P Higgins
Exec VP: Ralph F Gow
Sec: Richard Prouty
Treas: Wm H Perks
Gen Purch Agt: Geo D Sequin
NORTON PLANT, Bauxite, Mn
Idia

POROCEL CORP (SUBSID MINERALS & CHEM CORP OF AMERICA)

Essex Turnpike, Menlo Park,
N.J.
Pres: C A Specht
VP: A G Blake
Sec: M C Flint
Treas: R J Brockmann
Prod Div: T L Falkner
MINE, Little Rock, open pit,
bauxite
Gen Mgr: M N Rowland
(See N.J.)
(See Minerals & Chem Corp of
America, Fla, Ga, & Va)

REYNOLDS MNG CORP

Bauxite
MINE, undergr & open pit,
bauxite
Gen Mgr: R H Zeglin

SEARLES LAKE MINE, Lake

Brines, Trona, potash, borax,
soda salts, Br, Li
MILL & SMELTER, Trona

RUSS CREEK MNG & EXP CO, INC

Box 545, Yellville
Pres: C T Black
VP-Treas: W C Barnett
Sec: Garvin Fliton
RUSH DIST, Yellville, undergr,
open pit, Zn
Gen Mgr: Glen Leatherman
Supt: Van Walters
Asst Mine Supt: Gus Setzer
Under devel
200-TON FLOT MILL, Yellville
Idia
Supt: Van Walters
Asst Supt: John McNemar

STAUFFER CHEMICAL CO., CONSOLIDATED CHEMICAL INDUSTRIES DIV

6910 Fannin St, Suite 309 S
Houston 25, Tex
Sr VP & Gen Mgr:
E S Rothrock
VP & Prod Mgr: C M Hickey
Dir, Prod: H C Snowden
Purch Agt: A L Sweitzer
FEISER SPUR MINES & PLANT,
PO Box 65, Arch St, Substation,
Little Rock, open pit,
bauxite
Res Mgr: S M Stelling
Plant Mgr: E F Ackerman

U S MANGANESE CORP

Batesville
MINE, Mn
UTLEY, HARVEY
Box 431, Batesville
MINES, N of Batesville, open
pit, Mn
10-TON MILL, Ind County
Assayer: Bruce Williams

CALIFORNIA

ADELAIDE MINE

435 Hillcrest Rd, San Mateo
Own: A W Stickney
MINE, Mariposa Co, undergr,
Au,
Idia

AMERICAN CHROME CO

1 Montgomery St
San Francisco
Pres: Willie A Swan
VP & Gen Mgr: John Bley
Nye, Mont
VP: John L Lukens,
Sec: Geo M Spradling,
Treas: Sam Groody
Purch Agt: D W Graves
MOUAT MINE, Nye, Montana
(See Montana)

AMERICAN MINERAL CO

840 S Mission Rd, Leo
Angeles 23
Pres & Gen Mgr:
Blair W Stewart
VP & Asst Gen Mgr:
W A Merle
VP-Treas: E S Ellsworth
Asst Treas: Acot Sect
R D Murphy
Sec: Wm Walk, Jr
WHITE ROCK MINE, Cantil
open pit, ceramic clays
Mine Supt: Paul Edgemore
Prod: 1,000-1,200 tons
per month
MARTER-WHITE MINE,
Bryman, open pit Al₂O₃
Prod: 1,000-1,200 tons
per month
100-TON BALL MILL &
DRYERS, & RAYMOND
ROLLER MILL, at mine

AMERICAN POTASH & CHEM CORP

3000 W 6th St, Los Angeles
54
Pres: Peter Colefax
VP, Mktg: Wm J Francis
Sec: Fred Marale
Treas: L A Adams
Purch Agt: Lawrence H
Cornelius

AMERICAN SMELTING & REFINING CO

P O Box 33, Selby
MINING DEPT
Res: Geo L K Wilson
Mngt: J T Roy
Asst Mgr: G M Playter
Gen Supt: B K Shedd
Purch Agt: J M Hanna
Smelter Supt: C P Gough
Refin Supt: A L Labbe, Jr
Mach Supt: M E Griffith
Plant Engr: J N Green
(See Ariz, Colo, Idaho, Ill, Mo
Mont, Nebr, N.Y., N Mex, N.Y.
Tex, Utah, Wash, and Federal
Mng & Smelting Co, Mo)

AMER SULPHUR & REFINING CO

430 N Camden Dr,
Beverly Hills
Pres: T N Neale
(See Utah)

ANACONDA COMPANY, THE

35 Broadway, New York 4, NY
Pres: C M Brinckerhoff
Exec VP: Edward S McGlone
Sec-Treas: Ralph E Schneider
Dir of Purch: A Baird Harris
DARWIN MINE, Darwin, undergr,
Pb, Zn, Ag
Idia
FLOT MILL, Darwin
Idia
SHOSHONE MINE, Tecopa
undergr, Pb, Ag
Idia
125-TON FLOT MILL, at
Shoshone mine
Idia
(See Idaho, Mont, Nev, N Mex,
N.Y.)

ANTI ALKALIE

Cima
Own: H F Heather
MINE, Yermo, iron sulfate,
phosphate
Under devel

ANTONOWITSCH, JOHN K

Rt 2, Box 2032, Grass Valley
INDIANA MINE, Grass Valley,
Nevada County, Au, undergr
Under devel
10-TON MILL

AUSTIN, MRS. HENRY

Almaden
NEW ALMADEN MINE, Almaden,
Hg

AUSTIN & SMITH

983 Mills Bldg, San Francisco
ALTOONA MINE, Trinity Center
Hg

BEAM SMELTERS & IMPERIAL MINES, INC

10535 Buford Ave, Inglewood 2
Own: L Mills Beam
Idia

B M M Y MINING BOARD

980 S Dora St., Ukiah
Pres: M M Morris
VP: W Mayfield
Sec-Treas: C F Yuen
EMPRESS MINE, Largo,
Mendocino Co., open pit, Hg
Mine Supt: R A Beck
Under devel

MILL, Pilot plant only

SMELTER, retrofit
BAKER & SON MINING & DEV

5350 So Virginia St, Reno
Nev
MINE, U₃O₈

BALDERAMA, ANDREW

Almaden
NEW ALMADEN MINE, Almaden
Hg

BEAURACARD, D J & A E

607 W Pine, Bishop
SIERRA WASHINGTON GRP,
Mono County, Au, Ag
Idia

BEST MINES CO

Box 177, Downville
Pres: I L Best

VP & C Austin

Gen Mgr: L L Huelsdonk
GOLD BLUFF, BRUSH CREEK
& OXFORD MINES, undergr, Au
Mine Supt: W T Reed Jr
Engr: B C Austin
Master Mech: A R Huston
FLOT MILL
Supt: John Polson
Pres: Vernon Huffman

BIAGGINI, HAROLD

Box 533, Templeton
BUENA VISTA MINE, Adelaide,
Hg

BIG CHIEF MERCURY MINES

Box 235, Middletown
Own: W L MacKinnon
BIG CHIEF MERCURY MINES,
undergr, Open pit, Hg
Asst Mine Supt: Eddie Austin
Under devel

BLACK GIRL MINES CO

271 N Monterey Rd, Palm
Springs
VP & Gen Mgr: J M McFadden
Sec: Doris E McFadden
Geol: C M Shaw
(See Colo)

BLUE DIAMOND CORP

1650 S Alameda St, Los
Angeles 54
Pres: N J Redmond
VP, Prod: W G Bradley
Sec: Gene G Curry
VP-Treas: T L Donoghue
Purch Agt: B M Maris
(See Nev)

BLTYHE MANGANESE CO INC

1827 W Olympic Blvd
Beverly Hills
Pres: Georges F Kramm
Sec: G Wilkenauer
ARLINGTON GROUP, P O
Box 225, Blythe, undergr,
open pit, Mn
Prod: 250-350 tons
300-TON GRAV MILL, Inca
Idia
Mill Supt: A F Gartik
Idia

BRADLEY, P R & H

Valley Springs
PENN MINE, Calaveras County,
Au, Ag
Under Devel

BRADLEY & ECKSTROM INC

24 California St
San Francisco 4
Pres: E O Eckstrom
VP & Gen Mgr: R F Helmke
MINES, Ariz, Calif, Nev, Utah
Idaho, Ore, surface & undergr,
Cr, Fe, Ca₂, Mn, WO₃, rare
earths, asbestos
Supt: C Robinson
(See Idaho)

BRADLEY MINING CO

680 Market St, Rm 515
San Francisco 4
Pres: Jas P Bradley
Sec-Treas: G C Oriot
REED MINE, Lower Lake, Hg
(Leased)
SULPHUR BANK MINE,
Clearlake Oaks, Hg
GREAT WESTERN MINE, Middle-
town, Hg
Idia
(See Idaho)

BRIGGS, HARRY E

Box 613, Trona
RED CLOUD MINE, 10 mi E of
Ballarat, Panmint Mts, undergr,
Au, Ag, Pb
Under devel
SOUTHERN HOMESTAKE MINE,
8 mi S of Ballarat, undergr,
Au, Ag
Under devel
GOLDEN EAGLE, 8 mi SE of
Ballarat, undergr, Au, Ag, Pb
Prod: 10 tons
10-TON GRAV MILL

BROWN, JOSEPH G & BLANCHE F

Camptonville
Own: J G Brown
Blanche F Brown
DEPOT HILL MINE, Sierra Co, Au
(Leased to C R Echlin, Grass
Valley, Calif)

BUCKMAN LABORATORIES, INC., MNG DIV

Geyser Road, Choverdale
Pres & Gen Mgr: Dr S J Buckman
VP: W D Still
Sec-Treas: C H Turner
Purch Agt: M Blakelee
BUCKMAN MINES, undergr, Hg
Gen Mgr: Roger N Miller
Gen Supt: Harold D Field
Frm: A E Turpin
80-TON MILL, at mine
Under devel

BUENA VISTA MINE

Box 233, Templeton
Own: Harold J Blagotin
BUENA VISTA MINE, Adelaide
Rd, 17 mi W of Paso Robles,
open pit, Hg
Mill Supt: Rudolph Ruda
Prod: 115 tons
25-TON MILL, at mine
Mill Supt: Errol Dodd
Asst Mill Supt: Dee Fitzhugh

BUENA VISTA NO 2 MINE

Box 23, Redding
Own: H G Graves
MINE, 3 mi W of Redding, Au
Ca, WO₃
20-TON FLOT MILL
Idle

BUNKER HILL CO, THE

The Bunker Hill Bldg,
640 Market St, San Francisco
Actg Pres: Emmett G Solomon
VP: W G Woolf, D L Feathers
R H Cutting, H E Lee
Sec: D L Feathers
Treas: Emmett G Solomon
Purch Agt: Gil Mayes,
(See Idaho, Wash)

BURRO SHOE MNG CO, INC

2025 Bayler St, Duarte
Pres: Audley L Smith
VP: Cash L Swinney
Sec-Treas: Wm J Clark
BURRO SHOE MINE, Saline
Valley Dist, undergr, open pit,
Ca, Mo, Au, Ag
Prod: 28 tons
Gen Mgr & Geol: A L Smith
Gen Supt: Cash Swinney
Under devel

BURTON BROS, INC

Rosemond
Pres & Gen Mgr: C G Burton
TROPICO MINE, 5 mi W of
Rosemond, undergr, Au, Ag
Asst Mgr: G A Settle
Idle

CACTUS QUEEN MINE, 10 mi

NW of Rosemond
100-TON CYANIDE MILL, at
mine
Frm: Alec Burton
SMELTER, at mill
Idle

BUTTE MINES

3315 La Cresta Dr, Bakers-
field
Own & Op: J D Huston
BUTTE-MINE, 13 mi E of Glenn-
ville, undergr, & surface, WO₃
Geol: Chas Shaw
MINE, Rand mag dist, placer,
Au, WO₃
Prod: 150 tons
Under devel
MILL, at Glennville

BYERLY & THOMPSON

Box 253, Rt 2, Morgan Hill
NEW ALMADEN MINE, Almaden
Hg

CALAVERAS CENTRAL

GOLD MNG CO, LTD
Angels Camp
Pres & Gen Mgr: Harry Sears
Mgr: Desmond Sears
MINE, undergr, placer, Au
CRUSHING & SCREENING
PLANT, Au, Hvy aggregates
Prod: 800-1000 tons
Idle

CALIFORNIA LIMESTONE

PRODUCTS
Rt 1, Box 58, Blythe
Pres & Mgr: R E Hall
Sec-Treas: Maurice Willows Jr
LANGDON MINE, BOX 1084,
Blythe, 23 mi NW of Blythe,
undergr & surface, Mn
Gen Supt: James P Carr
Prod: 300 tons of Mill Grade
etc

CALIFORNIA PORTLAND

CEMENT CO
Genl Petroleum Bldg
612 S Flower St, Los Angeles
BASIN (CAVE CANYON, BAXTER)
San Bernardino County, Fo

CALRADO DEVEL CO

Rt 1, Box 58, Blythe
Co-Part: R S Hall &
Maurice Willows Jr
BLACK JACK-ARLINGTON
MANGANESE MINE, 23 mi NW
of Blythe, surface & undergr
(Leased to Blythe Manganese Co)

CAMERON & THRASHER

% Almaden Mining Properties
Almaden
NEW ALMADEN MINE, Almaden
Hg

CARLTON, E B

NEW ALMADEN MINE, Almaden
Hg

CARRIGAN MINES, INC

PO Box 3282, Hayward
Pres: E B Swanson
VP: G E Martin
Sec: Marjorie R Johnson
Treas: Irene Bickel
Purch Agt: E B Swanson
Dir: Field Mgr: F E Walker
Dir: J A Buhl
Dir-Field Supt: J D Long
AUTONITE URANIUM MINE,
Range 10 E, Township 5 N
Summit Dist
M D B M, Tuolumne County,
Calif, 13 mi above Carters
Strawberry Lodge, located on
Hwy 106, at intersection of
Eagle Meadow Rd & Niagara Cr
Autonite U.O.
Prod: Blasting out ore
bodies by Rotary drilling
Gen Mgr: E B Swanson
Gen Supt: F E Walker
Geol: E Boudreau
MILL, U₃O₈ to be built in area

CARRILLO, JUAN JR,

ET AL
Bitterwater Rd, King City
SANTA MARGARITA MINE,
Hernandes, Hg

CELTOR CHEMICAL

CORP
Box 858, Arcata
Pres: C C Celestre
VP: E Torre
Sec & Treas: K M Watson
COPPER BLUFF MINE, Hoopa
REFINERY, electrolytic &
fuming, Samon, Humboldt Co,
Supt: J MacGlinnie
Met: A Burwell

COG MINERALS CORP

Denver Club Bldg, Denver
Colo

Pres: W C Norman
VP: J H Nason
Sec: C W McDermott
ABBOTT MINE, Williams
undergr, Hg
Gen Mgr: F A Seaton
Mine Mgr: C O Reed
Geol: F D Hanson
Prod: 10 tons
25-TON J-JOTARY FURNACE
MILL, at mine portal, Hg
(See Calif)

COLUMBIA-SOUTHERN

CHEM CORP - (SUBSID OF
PITTSBURGH PLATE
GLASS CO)
#1 Gateway Center
Pittsburgh 22, Pa
PLANT, Bartlett, Owens Lake
dist, Borax
Plant Supt: Carl P Budke
Under Devel

COLUMBIA IRON MNG CO

(SUBSID OF U S STEEL
CORP)
120 Montgomery St
San Francisco
Pres: J D McCall
Exec VP: L J Westhaver
VP, Op: D E Rice
Sect D: J McDaniel
Mgr: Raw Mac Devolt
Ch Engr: W F Fuden
Dir, Ind Ret & Sales
Dir, Purch: R D Crowley
(See Alaska, Ala, Minn, Pa,
Tenn, Utah, Wyo)

COMPLEX COPPER INC

355 E 1st St, Los Angeles 12
Pres: H Kenen
VP: E J Nowotny
E C Mahanah
Sect: Mark Kenen
(See Ariz)

CONVERSE, ERNEST R

Geoderville
Pres: E R Converse
VP: O M Whitley
GOLD STAR & DONNA MINES
Bull Crk, Mariposa County,
undergr, Au, Ag, Cu
Prod: 4 tons

CORDERO MINING CO

131 University Ave, Palo Alto
VP: S H Williamson
Gen Mgr: J Eldon Gilvert
MAY LUNDY MINE, Mono
10 mi W of Mono Lake, Au
Idle
QUIEN SABE MINE, Hollister,
19 mi E of Hollister, undergr
Sb
Idle
Gen Supt: Herbert Mitchell
(See Idaho, Nevada)

CORONADO COPPER &

ZINC CO
523 W 8th St, Los Angeles 14
Pres: K Lieber
VP: H T Maude, P W Allen
Sec-Treas: C W Six
(See Ariz)

CRATER CHEMICAL

CORP
254 Yucca Vine Bldg
Los Angeles 28
Pres: Lillie Poulos
VP: Lottie Wind
Sec: Eva H Mason
Treas: Milton Michers
CRATER CHEMICAL MINE,
open pit, synthetic agricultural
Prod: 25 tons daily
(Leased to Santa Anita Growers
Co., Amboy, Calif)

CRYSTAL BALL MNG CO

21600 Bertram Rd, San Jose
MINE, Santa Clara County,
undergr & open pit, Hg
Gen Mgr: Woodrow Goodman
Gen Supt: Frank U Thompson
Geol: Jack Whittaker
Mech Eng: Arthur Morrill
Prod: 14 tons
MILL & REFINERY, at mine
Mill Supt: Wm Duarte
Prod: 17,300 lbs Hg yrl

CUMMINGS, ROBERT

739 N Highland Ave
Los Angeles 38
Gen Part: H Evan Roberts
(See Mont)

CURTIS, (THOMAS), T F

Box 6, Baker
JUNIPER MINE, San Bernardino
County, Cal

CYPRUS MINES CORP

1206 Pacific Mutual Bldg,
Los Angeles 14
Pres: H T Mudd
VP: A R Thomas
VP & Treas: H S Rye
Sec: L A Garret
Purch Agt: W F Stover
(See Ariz, Colo)

DAKIN CO

2811 Hillside Dr, Burlingame
Pres: Fred H Dakin
VP: Wesley W Kegan
Sec: Harrietta Dakin
UNCLE SAM MINE, 10 mi NW
of Central City, Shasta County
undergr, Au, Ca, Ag
Idle

DEL MONTE PROPERTIES

CO, S&B DIV
Box 150, Pacific Grove
Pres: Richard Gaboras
Gen Mgr: H H Bain
Sales Mgr: P C Valentine
Met: Henry Benesh
Gen Supt: C J Houseman
DEL MONTE SAND PLANT,
Del Monte Forest, Pebble Beach,
open pit, surface, glass and
quartz, feldspar, g sand
Prod: 800 tons
800-TON FLOT MILL
lime, asphalt, Ag, Rock
Mine Supt: J Heyne
P Walker
Mech Engr: John Drossart

ELC Engr: Joe Bermeich

Ch Chem: R B Lawson
MILL
Mill Supt: V Varozza

DIAMOND SPRINGS LIME

CO
P O Box 400, Diamond Springs
Pres & Gen Mgr: R S Locke
VP & Sec: P A Fout
Treas & Purch Agt: B Flynn
MINE, Diamond Springs,
undergr, open pit, limestone

DICKEY EXPLOR CO

Alleghany
ORIENTAL LODGE MINE, under-
gr, Au, Ag
Gen Mgr: Donald R Dickey
Geol: W Fuller
Idle
75-TON FLOT-GRAY MILL,
at mine
Assay: Abbott Hanks

DODD, J ERROL

Adelaida Route, Paso Robles
KLAU MINE, Adelaida, Hg

DOUBLE O TIMBER &

MNG CO
200 Davis St, San Francisco 11
Pres & Gen Mgr: Hans Hammer
VP: R S Currens
Sec-Treas: Albert S Smirak
DOUBLE O MINE, 50 mi NE of
Auburn, placer, Au
Geol: J E Siegfried
Under Devel

EAST RIDGE CO

6335 Shatto Place, Los Angeles
5
Pres: Carlton E Byrne
VP: F Mulzenhauer
Sec: Alice Davenport
(See Colo)

ECHLIN, CR

Box 245, Grass Valley
DEPOT HILL MINE, Sierra Co,
Au
(Leased from J G Brown &
Blanche F Brown)

EL DORADO PLUMBAGO

MINES CONS, INC
211 Octavia St, San Francisco
Pres & Mine Mgr: Roland P
DeGrio
VP: Ernest G Heath
Purch Agt: Lewis C Adams
Sec-Treas: Richard H Wong
Asst Sec-Treas: Geo V Daplatia
EL DORADO-LUMBAGO MINE,
Box 903, Alleghany, Sierra Co,
undergr, Au
Geol: Thomas H Taylor
Under Devel
50-TON FLOT MILL, at mine

EL DORADO LIMESTONE

CO
Shingle Springs
Pres: J H Bell
VP: E O Schmitt
Sec: H P Armes
Gen Mgr: C R Nichols
Purch Agt: G L Darrington
Gen Supt: W H Stinson
Sec: N P Armes
Elec Eng: Paul Ransom
LIMESTONE MINE, 4 1/2 mi
SW of Shingle Springs, El
Dorado Co, undergr, limestone
Mine Supt: F G De Berry
Prod: 600 tons
700-TON MILL, Crushing,
Screening
Mill Supt: Paul Ransom

ELECTRONIC MINERAL

& DEVEL CO
Box 289, Santa Clara
DAWSON MINE, Kings County, Hg
FLORENCE MACK MINE, San
Benito County, Hg
Idle

EMBASSY MNG & DEVEL

CO
P O Box 501, Alameda
MINE, Au, Ag
Idle

EMIGH, KENNETH

Soquel & Front Sts,
Santa Cruz
POLAR STAR, San Simeon, Hg
FIREBOARD PAPER
PRODUCTS CORP
(FASCO BLDG MATLS DIV)
475 Brannan St, San Francisco
Pres: W L Keady
VP: M K Baruch, W C Birdsey,

EW Carey, A S Halley

J F Havard, O C Majors,
W K Spence, J H Grady,
G W Burgess
Sec: J B Mitchell
Treas: V H Erickson
VP & Gen Mgr: R R Galloway
(See Colo, Nev)

FLEXIFORE ENGINEER-

ING & MNG CO
681 Market St, San Francisco
Pres: F W Handel
VP: M I Corne
Sec-Treas-Gen Mgr: W P Smith
WALLS MINE, Shasta County,
undergr, open pit, Ca
Gen Supt: R T Haddy
Idle

FLINTKOTE CO, THE

(US LIME PRODUCTS DIV)
2244 Beverly Blvd, Los
Angeles
Pres: G J Pecaro
Gen Mgr: Kennedy Ellsworth
Asst Gen Mgr: Hardin Stephens
Res Mgr: Ray, Ariz,
C MacDonald
Prod Mgr: L N Grindell
Res Mgr: Wm McCandish
SONORA MINE, Tuolumne
County, undergr
(See Ariz, Nev, Tex)

FLUORSPAR MNG CO

P O Box 308, Winterhaven
Pres: Kenneth Holmes
OROCOPHA MINE, Riverside
County, Ca, Fe₂
Idle

FOOD MACHINERY AND

CHEMICAL CORP
(WESTVACO MIN PROD DIV)
Box 337, Newark
Res Mgr: S M Cimino
Asst to Res Mgr: D C Linton
Oper Supt: A R Morgan
WESTVACO MINE, Box 981,
Hollister, surface, dolomite
Prod: 434 tons
Mine Supt: R Swindlehurst
600-TON MILL, Hollister
Mill Supt: R Swindlehurst
Assay: Norman Cunha
(See N Mex)

FOREMAN & FOREMAN

1354 Second Ave,
Salt Lake City, Utah
DEFENSE MINE, Inyo Co,
Box 409, Lone Pine, Pa, Ag,
Au, Zn

FOREST MINES, INC

Forest, via Alleghany FO
Pres: Cecil T Vivian
Sec-Treas: Virginia A Vivian
Gen Mgr: Cecil T Vivian
NORTH FORK MINE, Forest,
Sierra County, Au, quartz,
placer, undergr
Idle

FOSTER, CLYDE T

PO Box 332, Mariposa
SWEETWATER MINE, Mariposa
County, undergr, Au, Ag
Mine Frm: C W Fox
Prod: 10 tons daily
25-TON CHILLIAU FLOT
MILL, at mine

POWERMITE DRILL &

TOOL CO
PO Box 1121, Ontario
Own: Jack B Foster
NATCH A WATCHEE MINE,
San Bernardino County, undergr,
Au

4-D MNG CO

c/o Clyde Hewitt
Box 376, Johannesburg
YELLOW ASTER MINE, Kern
County, Au, Ag

FOUR-GEE MINE

Box 989, Escondido
Own: H Golem
FOUR-GEE MINE, Escondido
Pyrophyllite

FRIDAY NICKEL

SYNDICATE
3105 Wilshire Blvd
Los Angeles 5
Pres: D MacAfee
VP: Dudley Cornell
Sec: Saul J Barnard
Treas: Marvin L Tragerman
Tech Dir: M W MacAfee
FRIDAY NICKEL MINE, Julian
undergr, Ni, Co, S
Under devel

FULLER, FRANK J.
Box 218, Jackson
CENTRAL EUREKA, Amador
County, Au, Ag
Idle

GIBALTAR MNG CO INC
Box 216, Paramount
Pres: Wm Sievers
VP: Raymond Sievers
Sec-Treas: Robert Price
GIBALTAR GROUP, 19 mi NE of
Santa Barbara, over Depression
Dn, on Gibraltar Dam in Los
Padres Nat'l Forest, open
pit, undergr, quicksilver
Prod: 80 tons
Gen Mgr: Wm Sievers
Mine Supt: Arthur Stafford
100-TON MILL, Rotary Furnace

GIPSY MINE & MILL CO
1115 Wicks, San Valley
Pres & Gen Mgr: J H Bennett
Sec-Treas: A E Bennett
GIPSY MINE, San Valley, open
pit, Au, Ag, Pb, WO₃
Under devel
60-TON FLOT-GRAY MILL
Bakersfield

GISH BROTHERS
455 South 12th St, San Jose
NEW ALMADEN MINE, Almaden
Hg

GLADDING, McBEAN & CO

2901 Los Felis Blvd, Los
Angeles, 39
Pres: C W Flate
Sec: A Eccles
PLANTS, Corona, Inyo, Lincoln,
Pittsburgh, South Gate, Los
Angeles
MINES, Amador, Inyo, Kern
Los Angeles, Orange, Placer
Riverside, San Bernardino
& Yuba Counties

GLENN CO
703 37th Ave, Oakland 1
Own & Gen Mgr: George G Glenn
Gen Supt: Harry Odgers
MARBLE SPRINGS MINE, 12 mi
E of Coulterville, undergr, Au
Ag, Pb
50-TON FLOT MILL
Mill Supt: Frank Lane
Idle

GOLDEN DEAR MINE
495 N Bowling Green
Los Angeles 48
Pres: Ervin J Dear
MINE, Ord Mts, 15 mi W of
Lucerne, undergr, surface
U₃O₈
Th, Ag, Au
Under devel

GOLD HILL DREDGING CO
311 California St, San Francisco
Pres: J J Conery
Sec: R E McCarthy
Treas: C A Ames
Purch Agt: E O Perkins
FLACER PROPION Molemine
Riv in San Joaquin County,
Feather Riv in Butte County
bucketline, Ag, Au
Supt: H L Coney
Idle

GRAHAM, W L
2702 Stony Pl., Petaluma
JAMES CREEK MINE, Pope
Valley, Hg

GRANTHAM MINES
1915 S Coast Hwy
Laguna Beach
Own: Louise Grantham
WARM SPRINGS TALC
DEPOSIT, Inyo County, Talc
BIG TALC, 48 mi NW of
Shoshone
Mine Supt: John Odgers
Mine Frm: Tom Hardiman
Mine Engr: R H Franklin

GREAT LAKES CARBON CORP (MNG & MINERAL PROD DIV)

612 S Flower St, Los Angeles
Pres: G Skel Jr
VP & Gen Mgr: D L Mariett
Asst Gen Mgr & Sales Mgr:
J E Moran
Purch Agt: J Hughes
Tech Dir: P Lepple
GREAT LAKES CARBON CORP
QUARRY, 8 mi E Lompoc, open
pit, diatomaceous silica

Chief Geol: J W Reinhart
Prod Dpt Mgr: E A Harris
Mng Dpt Mgr: W D Stone
Chf Engr: D F Drysdale
Supt: J W Root
Asst Superv: J Gooderrama
Prod: 300-400 tons
400-TON MILL, Plant #5, 5 mi
E Lompoc
Plant Supt: E D Ingram
Asst Plant Supt: P Nighill
Plant Frm: M Grycko
Chemist: J Girard
Safety Engr: W G Stier
(See Colo, N Mex, Nev, Ariz)

H L M MNG CO
Actua Springs Resort
Pope Valley
ACTUA SPRINGS RESORT MINE,
Napa County, Hg
Idle

C W HARRIS MINE
Box 117, Rancho Santa Fe
Own: C W Harris
MINE, open pit, Pyrophyllite
Prod: 15 tons daily
50-TON MILL, 2 ME of
Rancho Santa Fe

HAUN, EDGAR T
2031 Jonathan St, San Jose
NEW ALMADEN MINE, Almaden
Hg

HEATHER, HARRY F
218 S Oak Knoll Ave
Pasadena 5
BRIGHT OUTLOOK MINE, Cima,
Ca
Under devel

HEAVY METALS CO INC
926 Alma St, Glendale 2
LA LIBERTAD MINE, San Luis
Obispo County, Hg
Idle

HIGHLAND QUICKSILVER INC

c/o Steve Somers
Box 898, Coalinga
LOS PICACHOS MINE,
San Benito County, Hg
Idle

HOFFMAN, O H & HALL, J W
Box 142, Proberta
CHANCELUILLU GROUP, 3 mi
N of Knob, open pit, Au, Ag, Cu
Under devel

HOFFMAN, JOHN
520 Santa Barbara St.,
San Luis Obispo
LA LIBERTAD MINE, Adelaide
Hg

HOLDING MINE & DEVEL CO
1230 N Lemon Ave
Monro Park
Pres: Jm C Holding
VP & Gen Mgr: P C Hillen
SHOESTRING TUNGSTEN MINE
Mono County, Tioga Pass near
Lee, Vining Canyon, undergr
open pit, WO₃, Mo, Ag
Idle

HOMESTAKE MNG CO
100 Bush St, San Francisco
Pres: Donald H McLaughlin
VP: James W Swent,
Guy M Bjorge, A A Gulick
Sec-Treas: John W Hamilton
Asst Sec: Wm W Murray,
M A Maan
Purch Agt: H D Anderson
(See So Dak, Utah, Wyo, Home-
stake Partners N Mex)

HUB MINING CO, INC
Allegany
Pres & Mine Mgr: Roland
De Grio
VP: Harold Morglin
Sec-Treas: Anthony Shalter
Eng: Thomas Taylor
MINE,
Idle

HUGHES, HAROLD
Rt 1, Box 176, San Martin
NEW ALMADEN MINE, Almaden,
Hg

HUNTLEY INDUSTRIAL MINERALS INC
Box 305, Bishop
Pres: W H Huntley
VP: D T Davis
Sec-Treas: Cecile M Huntley

Ofc Mgr: J C Leechman
COLTON MINE, 20 mi NE of
Bishop, open pit, pyrophyllite
LAWRENCE MINE, 3 mi S of Tin
Mountain in Ubehebe Range, open
pit, asbestos
PACIFIC PYROPHYLLITE MINE,
20 mi N of Laws, open pit,
pyrophyllite
HUNTLEY TALC MINE, 43 mi SE
of Big Pine, undergr, open pit,
talc
Prod: 20 tons
LITTLE ANTELOPE CLAY MINE,
Hot Creek Mead County, open
pit, White Kaolin Clay
Mine Supt: D T Davis
100-TON RAYMOND MILL, Laws
Mill Supt: D T Davis
Assay: Fred Yarchp

INDUSTRIAL MINERALS & CHEMICAL CO
6th & Gilman Sts, Berkeley
Pres: L R Morris
VP: A L Hendrickson
Sec-Treas: A L Forbes
SPANISH MINE, Nevada County,
open pit, barite
Idle
MILLS, Berkeley and Florin,
non metallic
Mill Supt: Forrest Rhodon
(See Nev)

IRON AGE MINES CO
P O Box 123, Twenty Nine Palms
Gen Part: I W McManis
IRON AGE MINE, 38 mi SE of
Twenty Nine Palms, San
Bernardino County, Fe, undergr,
open pit, Fe
Mine Supt: Tom Norris
Prod: 100 tons
150-TON MILL, at mine
Mill Frm: J H Munsey
SNOWFLAKE MINE, 23 mi SE of
Twenty Nine Palms, undergr,
open pit, Fe
Prod: 100 tons
Mine Supt: Tom Norris

JAMES CREEK PLACER CO

2034 Inola Ave., Napa
VALLEY, Pope Valley, Hg

JOHNS-MANVILLE PRODUCTS CORP
22 E 40th St, New York, NY
Pres: C B Burnett
VP: K W Huffine
Sec: H M Ball
Treas: J M Shackelford
Purch Agt: D H Lyons
Plant Mgr: O B Westmont
Asst Mgr: G O Schuknecht
Plant Engr: C A Carlson
Geol: E J Lommes
CELITE DIVN, Lompoc, surface
Diatomite
Quarry & Mines Supt:
C W Spar
Gen Frm: O C Benedict
Main Mine Supt: E W Hodges
MILL, at mine, air separation
Mill Supt: G W Porter
(See N Y)

JOLLY JACK URANIUM CO
703 Crescent Avenue
San Francisco 10
Pres: Richard H Hall
VP: Vernon R Alken
Sec-Treas: Stanley S Dunaway
(See Utah)

KAFKA, FRED & AUSTIN, DAN
Almaden
NEW ALMADEN MINE, Almaden,
Hg

KAISER RE-FRACORIES AND CHEM DIVN KAISER ALUMINUM & CHEMICAL CORP

300 Lakeside Dr
Oakland
Chmn & Founder: Henry J
Kaiser
Pres: DA Rhoades
VP & Gen Mgr:
F M Cashin
Sec: W P B Markie
Treas: R A Clayton
Purch Agt: D S Gregg
NATIVIDAD DOLOMITE QUARRY
Natividad, open pit, dolomite
Oper Mgr: J F Knight
Works Mgr: W T Burns
Plant Supt: Ivan Hall
Geol: E A Hassen
Plant Eng: J E Winters
300,000 TON-(Try)-HEAV-
MED-MILL, 3 mi NE of Salinas

KAISER STEEL CORP
Kaiser Center, 300 Lakeside Dr
Oakland 12
Fdr & Chmn of Bld:
Henry J Kaiser
Chmn of Bld: Edgar F Kaiser
V Chmn of Bld: E E Treyster, Jr
Pres: Jack L Ashby
Exec VP: L F Borden
VP & Treas: Alwood Austin
Gen Purch Agt: G W Kelly
EAGLE MOUNTAIN MINE
Box 158, Eagle Mountain
surface, Fe
Mgr: M J Hughes
Office Mgr: G R Riser
Geol: R W Brummett
Ch Eng: C E Davis
Mint Supt: C A Scott
Railroad Supt: V A Fischer
Beneficiation Supt: C W Reno
Gen Pit Frm: W A Norton
Prod: 7,000 tons
15,000 TON-HEAV-MED-JIG
MILL, at mine
Gen Frm: Benific: C W Reno
Ore Dressing Engr: R C Forbes
BLAST FURNACE

KATE HARDY MNG CO
Box 748, Grass Valley
Pres: Harold Hawn
HAWN(KATE HARDY) MINE,
Sierra County, Au, Ag
KENNEDY MINERALS CO INC

2590 E Olympic Blvd
Los Angeles 23
Pres: John J Kennedy
VP: A F Escobar
Sec: Paul H Wayne
Treas: Fred L Glover
ECLIPSE, Inyo County
TALC AND DEATH VALLEY,
Inyo, Co
LIMESTONE, Isabella & Kern
Counties

KERN COUNTY LAND COMPANY
808 California St
San Francisco 8,
Pres: Dwight M Cochran
Exec-VP, Oil & Minerals:
H L Reid
Mgr, Minerals Dept:
Jm T Griswold
Area Geol: Kenneth M Reim
Box 280, Bakersfield
(See Ariz, Idaho, Utah)

KIRK, GEORGE
16268 San Jose Rd, Los Gatos
NEW ALMADEN MINE, Almaden
Hg

KNEPPER, L W
Box 87, Indira
SANTA RITA, SANTA ANITA,
SAN CARLOS MINES, New
Iris Dist
San Benito & Fresno Counties
surface, Hg
EL CAJON MINE, Panoche Dist
San Benito County, surface, Hg
NORTH STAR MINE, San
Benito County, surface, Hg
Prod: 20 tons

KRITIKOS, W T
318 W Euclid, Stockton 4
OAT HILL MINE, 9 mi SE
Middletown, Napa County
open pit, Hg
Mine Frm: H L Capps
Prod: 10 tons hourly
200-TON OATHILL MILL, at
mine, Hg
Mill Frm: H L Capps
RETORT SMELTER

LINCOLN CLAY PROD CO
Box 267, Lincoln
Pres: M J Quilman, Jr
VP: K S Brown
Sec-Treas & Purch Agt:
A S Guilford
MINE, 1 1/2 mi N of Lincoln
open pit, fireclay
Mine Frm: C O Pardee
Prod: 450 tons
80-TON MILL

LIVE OAK MINES, INC
25556 N Sand Canyon Rd
Baugus
Pres-Gen Mgr & Purch Agt:
Challoner Thompson
VP: Thomas E Jackson
Sec-Treas: L B Thompson
MINE, open pit, titanium
magnetite, iron, Au, Pt
Met: Victor Jager
Geol: H C Babbitt
Ch Chem: Samuel Sklarew
Idle

LUCK MNG CO
215 Market St,
San Francisco 5
Mgr: J F Hutchins
(See N Mex)

MACCO CORP, BARITE DIV.

1448 S Paramount Blvd
Pres: John MacLeod
VP: John Robinson
Div Mgr: J D Hawkins
Mine & Mill Supt: Harry Parker
Purch Agt: Neil Giebler
BARITE QUEEN MINE, Box 286
Inyokern, open pit, barite
Prod: 300 tons
200-TON GRAY MILL, Hwy 395
6 mi S of Little Lake
BARITE KING #1, 2, 3, 4, 5, & 6
Nine Mi Canyon, open pit, barites
Gen Mgr: John Sawyer
Mgr, Drilling Fluid Divn:
Jas D Hawkins
Mine Supt: Harry Parker
Prod: 300 tons
130-TON GRAY MILL, Brown
and Rosamand

MINERALS PROD CO OF CALIF

1299 Bayshore Hwy
Burlingame
Pres: George N Keyston Jr
VP: H H Van Allen
Sec-Treas: David H Keyston
(See Colo)

MIRACLE MINE

near Bakersfield
Own: H B Mann
MINE, undergr, U₃O₈
Idle

MARRUJO, FRANCISCO
% New Almaden Mine, Almaden
NEW ALMADEN MINE, Almaden
Hg

MASONIC MINE ASSOC, A TRUST

750 12th St Apt # 103
Oakland 7
CHEMUNG MINE, P O Box 141,
Bridgeport, undergr, Au, Ag
Gen Mgr: E P Heinmeyer
Under devel

MINERAL MATERIALS CO
1145 Westminster Ave
Alhambra
Gen Mgr: C W Dutton
ATLAS SILICA MINE, P O Box
394, Oro Grande, surface,
silica quartzite
Gen Supt: Roy Hill
Mine Frm: Lloyd Bailey
Ch Eng: M W Redhead
Prod: 200 tons
800-TON MILL, Oro Grande, jaw
crusher and 7 rolls
(See Nev)

MINERALS PRODUCTION CO

440 N 7th, Grand Junction,
Colo
Part: D V Watrous, R D Kasach
Treas: R J Havill
AMARGOSA PLACER, Baker,
Calif, Au
Under devel

MOBLEY, HARRY
Rt 1, Box 174, San Martin
NEW ALMADEN MINE, Almaden,
Hg

MOLYBDENUM CORP OF AMERICA

375 Park Ave, New York, NY
Pres: Marx Hirsch
VP: E A Lucas
Treas: Wm Kuntz
Gen Mgr: H D Bailey
Asst Gen Mgr: Russell Wood
Met: H S Woodruff
MT PASS MINE, Nipton, 60 mi
SW of Las Vegas, Nev, on US 91
open pit, rare earth metals
Mine Frm: Ira Proud
Prod: 150 tons
150-TON FLOT MILL
Mill Supt: G H Lee
(See Colo, N Mex, NY, Pa)

MONOLITH PORTLAND CEMENT CO

643 S Olive St, Los Angeles 14
VP: Hugh O McBride
GOLDS PAR MINE, 33 mi SE of
Beatty, open pit, CaF₂
Supt: Charles Hoffman, P O Box
334, Beatty, Nev
(See Nev)

MOORE CREEK MNG CO
3031 County Club Blvd
Stockton
MOORE CREEK MNE
Calaveras County, WO,
Idle

MORRIS SAVINE MNG CO
Box 7, Oroville
Pres & Gen Mgr: J H Sharpe
VP: Roy A Hundley
Sec: John F Daly, Jr
Treas: E D Stouts
MINE, 6 mi NE of Oroville,
undergr, Au

MOUNT GAINES MINES
Hornitos
Own: J W Radil, 444 California
St, San Francisco 4
MT GAINES MINE, Hornitos,
undergr, open pit, Au
Supt: J A Siefert
Elect Eng: C L Brehrmer
Prod: 40 tons
50-TON FLOT MILL

MOUNTAIN COPPER CO
OF CALIF
230 California St, San
Francisco
Pres & Gen Mgr: C W McClung
VP and Asst Gen Mgr
R K Barcus
Sec: Dudley F Miller
Treas: E G Rebscher
Purch Agt: S D Dodds
Sales Mgr: M M Stockman
IRON MTN MINE, Matheson
Station, Redding, iron pyrites
Master Mech: Ben Jackling
Mast Frmn: F M Serpe
Pit Frmn: W H Calhoun
Mine Engr: D K Winsor
Mine Frmn: W H Calhoun
Prod: 300 tons
900-TON CRUSHING PLANT,
at mine

MOUNTAIN LILY MINE
Columbia, Calif
Own: A A Adams
MINE, undergr & placer, Au, Ag
Gen Supt: J T Owens
Mine Supt: R Jackling
Under devel
MILL complete 3 stamp mill
Prod: 20 tons daily

MUGWUMP MNG CO, INC
250 Monterey Rd, So Pasadena
Pres: Virginia A Vivian
VP: Harold T Goodfellow
Sec-Treas: Fred W Rollyson
Supt: Cecil T Vivian
MUGWUMP, LIVE YANKEE,
YOUNG AMERICA, EXCHANGE
GOLD BUG MINES, Forest
City via Allegheny, FO, Sierra
County, undergr, Au
Under devel

MULTI-MINES CORP
2550 E Olympic Blvd
Los Angeles 23
Pres: John J Kennedy
VP: A F Escobar
Sec: Paul H Wayne
Treas: Fred L Clover
DEATH VALLEY TALC MINE
Inyo County, talc
IBEX MINE, Inyo County, Clay

NATIONAL COPPER CO
Box 67, Kernville
Pres & Own: D A Boyd
BEAUREGARD EXTENSION MINE,
N of Camp Wishon on Tule River,
undergr, open pit
Under devel

NAT'L LEAD CO, BAROIL
DIV
3404 Danville, Houston, Texas
NECTOR MINE & PLANT,
Newberry, undergr, bentonite
Supt: Jack Harford
MERCED MILL, Merced, dry
grinding of barytes
Supt: Lewis Busch
(See Ark, Colo, La, Mont, Mo,
Nev, NY, Tenn, Tex, Wyo)

NATOMAS COMPANY
607 Forum Bldg
Sacramento
Pres & Gen Mgr: R G Smith
VP: Mortimer Fleishacker, Jr
Raymond W Ickes
VP & Sec-Treas: Chandler Ickes
Asst Sec-Treas: Wanda Durkee
Chmn of Bd: R K Davies
Mgr Gold Dredging Dept:
Cyril Thomas

PLACER MINE, Natoma, 30 mi
E of Sacramento, Au
(See Colo)

NEW IDRIA MNG & CHEM
CO
Idria
Pres: C Hyde Lewis
Sec-Treas: Arthur W Goring
QUICKSILVER DIVISION, Idria
San Benito County, undergr, Hg
Div Mgr: Wesley Shaddock
Geol: Robert K Linn
Mine Frmn: Victor Sola
MILL, at mine
STRAWBERRY TUNGSTEN
DIVISION
1850 Tyler St, Fresno, undergr,
WO,
Div Mgr: Milan C Richardson
Office Mgr: Palmer Deines
(See Colo)

NIETO LODE & PLACER
CO
988 N Western, Los Angeles
Pres: S W Neighbors
VP: G A Niets
Sec & Treas: Ed M Hayzen
MINE, Rand Acta, Au, Ag, WO,
Gen Mgr: S W Neighbors
Asst Gen Mgr: H Atwood

NEW PENN MINES, INC
Camp Seco
Pres: R F Playter
Sec: J H Nichols
PENN MINE, 1 mi W of Camp
Seco, Cu, Zn, Ag, Pb, Au
Idle
200-TON FLOT MILL

NEW VERDE MINES CO
PO Box 1027, Grass Valley
BROWN VALLEY GRP, Yuba
County, Au, Ag

NONA MNG CO
Bernardine St, San Benito
Mgt: A M Moreno
NONA MINE, San Benito
County, Hg

NORTHWESTERN MINING
CO
PO Box 809, Des Moines,
Wash
Own: Alfred W Peeler
BOULDER GULCH GROUP, 8 mi
W of Sayers Bar, Siskiyou
County, placer, Au, Ag
Supt: A Everett Miller
Under devel
(See Wash)

OIL BASE, INC
130 Orias St, Compton
LEVATHAN MINE, San
Bernardino County, Ba

ONTOP MINE
Meadow Valley, via Quincy
Own: H E Fowler
MINE, 3 1/2 mi S of
Bucks Lake, undergr, Au, Ag
Under devel
6-TON GRAV QUARTZ MILL

ORIGINAL 18 to 1 MINE
INC
223 Montgomery St,
San Francisco 4
Pres-Gen Mgr:
Wm M Maxwell
Sec-Treas: Jack Maxwell
VP: C A Bennett
Frnm: N C Hart
150-TON CONC & AMAL PLANT
Mill Frmn: J B Hundley

OSBORNE, WOODROW &
BILLINGS, WR
PO Box 208, Templeton
SENATOR MINE, Adelaide, Hg

PACIFIC CLAY
PRODUCTS
Box 2178 Term Annex
Los Angeles 54
Pres & Chf Exec Off:
John D Fredericks
Exec VP: Kenneth Barrette
VP, Sales: John C Culhane
VP, Research: Alec Bennett
Sec-Treas: Walter M Colley
Dir of Purch: Marshall L Morgan
ALBERHILL MINE, open pit,
clay

Supt: J Harvey Gardner
NORTHERN MINES, open pit
clay, silica
Supt: O M Tupper
Chem & Plant Mgr:
O M Kilgore

100,000-TON-(dry)-FLOT MILL
Camanache
Chem & Plant Mgr:
Oakes M Kilgore

PACIFIC INDUSTRIES
INC
Box 980, San Jose
Pres: Donald D Smith
VP: John R Plant
Sec-Treas: Ronald Bailey
Purch Agt: Nick Eliskovitch
CENTRAL EUREKA MINE
Sutter Cr, undergr, surface
potash, P, V UOg
Gen Mgr: Nick Eliskovitch
Geol: Robert E McDonald
Idle
(See Colo)

PACIFIC INSTITUTE OF
EARTH SCIENCES
PO Box 31437, Los Angeles 31
Pres: H A Shiffer
VP: F T Leonetti
Sec: A E Beaumont
Treas: I M Beebe
Dean, Coll of Mines:
Dr Clarence Lamb

KERN FOURTEEN MINE
Tehachapi Mts, Kern County,
undergr, WO,
Under devel
Gen Supt: Bill Weisgerber
Geol: Dr H A Shiffer
UPPER PARADISE #3, Paradise
Mts, Coyote Dry Lake Area,
Box 713, Barstow, WO,
illimitic, undergr
Gen Mgr: Dr Clarence Lamb
Geol: Dr H A Shiffer
Met: H Ellis
Idle
(See Shiffer Pacific Co, Calif,
Nev; H A Shiffer, Calif; Upper
Paradise Mines, Calif)

PACIFIC MINERALS CO
LTD
117-118th St, Richmond
Pres: C L Renwick, Jr
Sec: T H DeLap
PLACERVILLE & SHINGLE
SPRING MINES, asphalt
coapsstone, slate roofing
granulals
Mine Supt: G H Bishop
MILL
Supt: Ed Bishop
MINE, Willits
Supt: Curt Wilson
MINE, Box 506, Eureka
Supt: Don Boughton

PALO ALTO MNG CORP
1900 Coleman Rd
San Jose 34
Pres: Fred H Smith
VP: Geo E Carlson
Sec-Treas: Mrs. Veta H Latham
GUADALUPE & CEDAR
MOUNTAIN MINES, San Jose
Alameda County, Cr, O₂, Hg
undergr, open pit
Gen Mgr: George E Carlson
Mine Supt: John Gargan
Under devel
50-TON GRAV MILL, at
Guadalupe mine

PANCO MNG CO
33 Karen Lane, Walnut Cr
Own: H O Sherwood
RAY SCHULTE RANCH MINE
Petaluma, Cheshono Valley Dist
undergr, placer, Hg
Prod: 300 the reurt
300-LB-MILL, Marin Co

PFEIFFER, FRANK
18931 Graystone Lane
Los Gatos
NEW ALMADEN MINE,
Almaden, Hg

PHILLIPS, H J
1381 Chas & Ave, El Cajon
PHILLIPS MINE, 3 mi SE of El
Cajon, undergr, Au, Cu, Pb
AMAL-GRAV MILL
Under devel

PIERCE, ROY &
PETERSON, C J
124 Altkinson, Watsonville
FREDANA MINE, Parkfield
Hg

PIMA MNG CO
523 W 6th St, Los Angeles 14
Pres: H T Mudd
VP: AR Thomas
A Christensen, H S Mye
R W Allen
Sec: D Evans
Treas: C W Six
(See Ariz)

PIONEER PYROPHYLLITE
PRODUCERS
Owned by Torrance Sand &

Gravel Products Co
25701 Crenshaw Blvd
Torrance
PIONEER MINE, near Rancho
Santa F, pyrophyllite
MILL, Chula Vista
PLACERVILLE SLATE
PRODUCTS CO
PO Box 63, Placerville
Part: W E Bishop
Jack Bishop
Geo H Bishop
CHILI BAR QUARRY, undergr,
roofing granules, asphalt,
stabilizers
Prod: 75 tons daily
MILL
Prod: 150 tons slate daily

POWHATAN MNG CO
8721 Windsor Mill Rd
Baltimore, Md
Pres & Gen Mgr: F A Mett
VP & Sec: Ch Silver
Treas: E L Farley
Off Mgr: F E Mett
SHASTA COUNTY MINE, open
pit, asbestos
Gen Mgr: J C Kempvance
(See Md)

PREMIER LIMESTONE
PRODUCTS
Suite 441
Title Insurance Bldg
493 S Spring St
Los Angeles 13
Pres: Glen W Watson
VP: Donald M Outafon
SHEEP CREEK DEPOSIT,
vicinity of Wrightwood, San
Bernardino County, Calcium
Limestone, open pit
Prod: 300 tons per day
Quarry oper: Dale Douce
Prod: 400 tons per day

PROVIDENCE TOLUMNE
GOLD MINES, LTD
1666 Union St
San Francisco 23
Pres: Bert C Austin
VP: C C Celestre
Sec: F Grotynha
COPPER BLUFF MINE
Humboldt County, undergr, Cu
Au, Zn
Gen Mgr: J MacGinnies
Mine Supt: W M Graham
Prod: 30 tons
150-TON FLOT MILL, 2 mi W
of Hoopa
Mill Supt: Ralph Hutchins
Asst Mill Supt: Lorraine McLenen

QUEENS PEAK MNG CO
Carberville
MINE, Shelter Cove, Humboldt
Co, open pit, Mn, Fe, Silica
RAINBOW MINES
Major Transit Rte II-A
Nevada City
Own: F L Whitney
LINDY PLACER MINE, middle
fork of Yuba River
FORT KNOX MINE, S fork of
Yuba River
Under devel

RAMIREZ, LORENZO
% New Almaden Mine,
Almaden
NEW ALMADEN MINE, Almaden
Hg

RELIABLE MEAT CO,
INC
PO Box 668, S San Francisco
Calif
(See Nev)

ROMP, J C &
MCGLINCHEY, ED
PO Box 221, Randsburg
BULLDOG GRP, San Bernardino
County, undergr, Au
Idle

ROYER, FRANK W
Rad Mt
KELLY MINE, San Bernardino
County, Au, Ag
Idle

RUBY & CITY OF SIX
MINES CO
PO Box 903, Allegheny
Pres & Gen Mgr: Roland
de Ovis
VP-Sec: Wren Frederking
MINE, Allegheny, undergr,
placer, Au, Quarts
Mech Engr & Asst Mine Supt:
Harold Darwitt
Mine Engr: Thomas Taylor
Under devel

S P LODE MINE
1381 Chas & Ave, El Cajon
SP MINE, 7 mi S of Ocotillo in
Davies Valley, Imperial County
(Ocotillo is on Hwy 80), undergr
open pit, WO, (Scheelite) 3
acre outcrop
Under devel

SALMON RIVER MINES
CO
Callahan
Pres & Gen Mgr: E C Latham
VP: I J Harter
Sec-Treas, Purch Agt:
V W Peterson

TRAIL CREEK MINE, Au
undergr,
50-TON FLOT MILL
Idle

SAN GABRIEL VALLEY
PLACERS
1237 S Greenwood Ave,
Montebello
Own: Robert A Riggs
MINE, 2 mi W of Azusa, placer,
Au, Ag
GRAV MILL

SAN JOAQUIN DREDGING
CO
3180 E Nevada Ave, Fresno
MCCOAN LEASE, Madera
County, Au, Ag
Idle

SANTA ANITA GROWERS
CO
Amoby,
CRATER CHEMICAL MNE,
open pit, gypsum agricultural
Prod: 25 tons daily
(Leased from Crater Chemical
Corp, Los Angeles 38, Calif)

SANTA MARGARITA MNG
CO
1450 E Ave, Selma
SANTA MARGARITA MINE,
San Benito County, Hg

SCIOCCHETTI, DONALD
PO Box 637, Hollister
DAR MINE, Palmdale, Hg

SCIOCCHETTI, LOUIS
PO Box 637, Hollister
JUNIPER MINE, Palmdale,
undergr, open pit, Hg
Prod: 5-75 tons per day
85-TON MILL, Griswold
Canyon

SEQUOIA MNG CO INC
218 Palm Ave, Imperial
Beach
Pres: J G Kromschroeder
VP: C E Brunson
Sec-Treas: J Jackson Willis
ALLIANCE MINE, Darwin,
undergr, Sledite Talc &
Lava Talc
Gen Mgr: James M Muir Jr
Idle

SHASTA MINERALS &
CHEM CO
Box 857, Redding
Pres: K L Stoker
VP: Harper Hunsaker
Sec-Treas: Reed L Reeve
Asst Sec-Treas: Nancy C
Hardman

WEST SHASTA COPPER ZINC
DIST MINE, undergr, Cu, Zn
S, Fe, Au, Ag
Gen Mgr: W J Walker
Asst Gen Mgr: E E Mallott
Mine Engr: Robert Patrick
Under devel

H A SHIFFER ASSOCIATES
5618 1/2 E Beverly Blvd
(PO Box 31427 Los Angeles)
Los Angeles 22
Pres: Dr H A Shiffer
VP: Frank G Tonlay
Sec-Treas: A E Beaumont
Purch Agt: Walter Wernecke
VIRGINIA & POSO MINE, Poso
Creek, Fine Mt Mng Dist, Kern
County, placer, black sand, Cu
Ti, Zr, Au
Geol: H A Shiffer
(Leased out to Pac Inst)
FLOT MILL, at mine
(See Shiffer Pacific Co, Calif,
Nev, Upper Paradise Mines,
Calif; & Pacific Institute, Calif.)

H A SHIFFER
ASSOCIATES SCIENTIFIC
FOUND, INC
108 N 3rd St, Las Vegas,
Nevada
Pres: Dr. H A Shiffer

VP: R James

Sec: A E Beaumont
Treas: Ann Fishback
Purch Agt: Walter Wernecke
Nevada Counsel: Robert Cohen
SIERRA SCIENTIFIC NO 1,
Sec 5 St, Hwy 188, High Sierras,
Fresno Co., Calif., undergr.
Beryl

Under devel
Gen Mgr: F C Tooley
Gen Supt: J Stark
Geol: Dr H A Shaffer
Met: H Ellis
SIERRA SCIENTIFIC LODGE NO
1, Horshoe Bend, Kings
Canyon Natl. Forest, undergr.,
Au, Beryl, Zr
Gen Mgr: F C Tooley
Gen Supt: J Stark
Geol: Dr. Shaffer
W Welgerber
Mine Eng: Dr L Clont
LABORATORY, Buckeye Flat
(Jt Ownership of SHIFFER
SCIENTIFIC FOUND., PACIFIC
INST & has 1/3 share in
ASSOCIATES MINING SERVICES)

SILVER LAKE MNG & MLG CO

12707 Mattonson, Los Angeles
Pres & Gen Mgr: William R Long

VP: Mitchel Kova
Sec-Treas: Chester D Baker
Purch Agt & Asst Gen Mgr:
R Johnson

SILVER HILL MINE, Baker

San Bernardino Co., open pit,
Ag, Pb
Met: Harvey Crawford
Geol: Arthur Davis
Mine Supt: Wm R Long
Under devel

50-TON FLOT-GRAY MILL,
Silver Lake

Whiting #2 SMELTER,
Silver Lake

SILVER LEAF MNG CO

6454 Liggett Drive, Oakland
(See Utah)

BISKON CORP

Box 889, Reno, Nev
Pres: H B Chessher Sr
VP: E J Schrader & H B
Chessher, Jr
Sec: J E Chessher
Asst Sec & Treas: A L Chadek
BISKON MINE, Box 148, Happy
Camp, open pit, Au, Ag
Gen Supt: V P H Chessher Jr
Pst Frnt: C W Cousineau
Prod: 400 tons
Mill Supt: A L McFarland
Main Frnt: Ralph W Moody
(See Nev)

SONOMA QUICKSILVER
MINES INC

Box 226, Guerneville
Pres: S R Smith
VP: J R Wood
Sec-Treas: J W Cook
MY JACKSON MINE, Guerneville
undergr., Hg
Gen Mgr & Supt: G F Reed
Geol: F N Frederick
Mine Supt: Graydon Weaver
Mine Frnt: R G Walker
Mech Eng: J L Galli
Prod: 100 tons
100-TON MILL, at mine, rotary
furnace & condensers
Assay: J F Hill

SOUTHERN CALIFORNIA
MINERALS CO

329 So Mission Rd,
Los Angeles
Part: W K Sheech, Jas K Sheech,
T A Sheech
DEATH VALLEY AREA TALC
MINES, Shoshone, talc, clay
undergr., open pit
Mine Supt: Ben Gomez
75-TON AIR FLOAT MILL,
Los Angeles
Mill Supt: Glen Hodges

SPANISH MINE

100 Palm Ave, San Rafael
Own: Louis R Moretti
SPANISH MINE, Washington
surface, barite
Prod: 30 tons
150-TON MILL, Florin
Mill Supt: Forrest Rhodon
SPAULDING, L B
Box 18, Ramona
METAL MT MINE, Jacumba,
undergr., WO₃

Idle
LITTLE THREE MINE, Ramona

Pegmatite minerals

STAFFERS, GEORGE &
TURNER, MORRIS

A Imaden
NEW ALMADEN MINE, Almaden
Hg

STOTESBERRY, L

18251 Almaden Rd, San Jose
NEW ALMADEN MINE,
Almaden, Hg

SULPHUR MNG & SUPPLY
CO

1981 E Glen Oaks Blvd
Own: Grover Khorny
WEST COAST SULPHUR MINE,
Inyo County, S, open pit,
Idle
(See United Mercury & Oil
Corp, Utah)

SURCEASE MNG CO

3224 Broadway
Sacramento 17
Pres: Mrs. Josephine A
Hoefling

Sec-Treas: J B Gee
ATOLIA MINES, Box 37, Red
Mountain, 3 1/2 mi S of Red
Mountain on Hwy 395, surface,
undergr., WO₃

TARSA, M

Almaden
NEW ALMADEN MINE, Hg

TAYLOR-KNAPP CO,
THE CALIF DIV

640 Moraga St, San Francisco
Pres: S R Knapp
VP: A V Taylor, Jr & C P
Knaebel

Sec: A C Kremer
Ch Eng: C P Knaebel

TIGHTNER MINES CO

Rm 549, 58 Sutter St,
San Francisco
Pres: Robert E McCulloch
RED STAR GROUP, 1/2 mi N of
Allegheny, undergr., Au, Ag

50-TON GRAY MILL
(Leased to Endurance Mining Co)

TOLLAND BROS

Box 341, Leevining
Gen Mgr: G H Tolland
BARBARA & BIG MUOGETT
MINES, 12 mi NE of Leevining
Au, Ag, Pb
BRIGHT STAR MINE, 8 mi W of
Conway, undergr., Au, Ag, Pb,
Bi

Under Devel

TRASHER & STEIDLEY

Almaden
NEW ALMADEN MINE,
Almaden, Hg

TRI-PARTNER MINING
CO

831 E Main St, Stockton
Pres: Clifton Finley
Sec-Treas & Gen Mgr: LeRoy
A Washburn

SUNNY PLACER MINE, Buena
Vista, placer, Zr, Ti, Au

WONDER QUARTZ MINE
Groveland, undergr., Mn
Gen Mgr: LeRoy A Washburn
Asst Gen Mgr: Clifton Finley
Frnt: Edmund Watters
ELLA MINE, Amador County,
Au, Ag

TURNER, E

2005 Western Ave, Petaluma
GAMBONINI, Marshall, Hg

UNDERWOOD, HORACE V
& CATHERINE

156 Locust Ave, Hollister
BITTER WATER QUICKSILVER
BITTER SWEET MINE, Panoche
dist, SE of Hollister, Hg
Idle

UNION CARBIDE
NUCLEAR CO. (DIV OF
UNION CARBIDE CORP)

Bishop
PINE CREEK MINE, 21 mi NW
of Bishop, undergr., surface
WO₃, Mo
Gen Mgr: H L McKinley
Purch Agt: C A Smith
Mine Supt: L A Wright

Mine Frnt: E J Birch
Eng: D J Markl
1,000-TON FLOT MILL
Pine Creek
Supt: L E Sousa
Plant Met: J E Martinson
Mill Frnt: H Q House
(See Colo, N Y, Nev, Utah, Wyo)

UNITED MERCURY
PRODUCERS ASSOC

44 Mesa Court, Atherton
OLD ALMADEN GROUP, Santa
Clara County, undergr., open
pit, Hg
RETORT

U S BORAX AND
CHEMICAL CORPPACIFIC COAST BORAX
DIV

630 Shatto Place
Los Angeles 5
Pres: J M Geratley
Exec VP: Hugo Riemer
VP, Adm & Treas: R F Steel
VP, Tech Dpt: D S Taylor
VP, Prod: R T Edgar
VP, Mngt: J F Corbitt
VP, 20 Mile Team Prod:
D V Parker
Dir of Purch: J C Walker
MINE, Boron, open pit, borate
ores
Res Mgr: W J Diffley
Chf Mech Eng: D Fugit
Mine Supt: W H Wamsley
Asst Mine Supt: R E Kendall
Chf Geol: S Muesig
Ch Chem: V Morgan
Gen Mine Frnt: P A Conte
BORON REFINERY, Boron
Refin Supt: A Bela
Process Supt: T Cromwell
(See N Mex, NY)

U S GYPSUM CO

300 W Adams St, Chicago 6
Illinois
MIDLAND MINE, Midland,
Erysmum
Works Mgr: W E Watkins
(See Colo, Conn, Ill, Ind, Iowa
Mass, Okla, So Dak, Tex, Utah,
Va)

U S PUMICE SUPPLY CO
INC

6331 Hollywood Blvd
Los Angeles 28
Pres: Sheldon P Fay
VP: L B Clark
Sec: Leona Steinhuber
Treas: George H Lindsey

LEE VINING MINE & MILL, Lee
Vining, surface, pumice stone
Gen Supt: D H Campbell
CLASS MTH MINE & MILL
Tulelake, surface, pumice stone
Gen Supt: Lynn Clark

UPPER PARADISE MINES
ASSOC INC

(wholly owned subsid of
Pacific Co Inc)
108 N 3rd St, Las Vegas
Pres: H A Shiffer
VP: F T Leonetti
Sec: A E Beaumont
Purch Agt: W Wernecke

VERONICA MINE, PO Box 713

Barstow, Sec 6 1/2 N S E MDD & M
Paradise Mts dist, San
Bernardino County, rare earths
Geol: H A Shiffer
Geochemist: Sieve Lammie
Under devel
(See Nev, Shiffer Pac Co, Cal,
Nev, H A Shiffer Assoc, Cal,
Pac Institute, Calif)

UTAH CONSTRUCTION
& MNG CO

100 Bush St, San Francisco 4
Pres: A D Christensen
Exec VP & Gen Mgr:
E F Littlefield

VP & Mgr Mag Div: J A Meis
Purch Agt: J B Hale
(See Utah, Wyo)

V & W MINING CO

Almaden
NEW ALMADEN MINE,
Almaden, Hg

VALK, H L

Rt 3, Box 1360A, Oakdale
JUNIPER MINE, Tuolumne
County, UO₃

Under devel

MILL, Tuolumne County
Leased to Lakeview Mng Co
Lakeview, Ore

VICTORVILLE LIME
ROCK CO

Box 548, Victorville
Pres: K L Ayers
Sec-Treas: E A Piercy
VICTOR QUARRY, Victorville
open pit, limestone
Gen Mgr: E A Piercy
700-TON GRINDING MILL
Victorville
Mill Supt: Silas Guy
Asst Mill Supt: Emmett Ball, Jr
FURNACE CANYON MINE,
Lucerne Valley, open pit
Gen Mgr: E A Piercy
Gen Supt: Emmett Ball Jr
Geol: Robert Gessner
700-TON MILLS, Lucerne
Valley

VOLLMAR, FRANK

P O Box 281, Cambria
OCEANIC MINE, Cambria, Hg

WALSH CONSTRUCTION
CO

711 3rd Ave, N Y
Field Office, Box 547, Oravillo
Calif.

Pres: T J Walsh, Jr
Mgr. Mng Div: L E Huntington
Mng Eng: S O Simanstad
Under devel

WESTERN DEVEL CO

Rt 1, Box 55
Biller
Part: R S Hall & Maurice
Willows Jr

MINE: 18 1/2 mi NW of Blythe
open pit
Idle

WESTERN HEAVY
MINERALS INC

1680 El Nido Way,
Sacramento,
Pres: M C Heaney
VP: J M Branigan
Sec: F McMullin
MINE, Placer County, placer,
Au, Pt, Zircon, Rutile
Gen Mgr: M C Heaney
Geol: M C Heaney

WESTERN TALC CO

1901 E Slauson Ave
Los Angeles
Pres: F H Savell, Sr
VP: Malcolm Stewart

WESTERN MINES, Operating
on Snow Goose claim, 17 mi SE
of Tecopa, San Bernardino
County, talc

Mine Supt: Larry Lee
MILL, Los Angeles and Dunn,
San Bernardino County
Capacity: 150 tons per day
average

WILLOW VALLEY MINES
CALIF, INC

461 Market St, San Francisco
Pres: Lee G McCoy
VP: Lowell B Hall
Sec-Treas: George V Pettigree
Purch Agt: L Manson

WILLOW VALLEY MINES
Nevada City, undergr., Au, Ag
WO₃

Geol: J F Siegfried
Prod: 75 tons
MILL, Nevada City
Supt: Ed O Berger
Asst Supt: G E Hiller
Under devel

WIND WHEEL MINE

Box 181, Columbia
Own: R O Greaves
MINE, undergr., Au, Ag
3 1/2-TON GRAY MILL, at
mine

RETORT SMELTER, at mine

YANKEE JOHN MINE
37 Canyon Rd, Salt Lake City
Utah

YANKEE JOHN MINE, Shaata
County, Au, Ag
Under devel

YRACABEL, VINCENT

PO Box 17, Middletown
OAT HILL MINE, Aetna Springs
Hg

YUBA CONS INDUSTRIES
INC

YUBA CONS GOLD FIELD DIV
351 California St
San Francisco 4
Pres: John L McGara
VP, Mgr: E J Gorman
Sec: E K Allison
Treas: W J Holcombe

MDME, Star Rt, Marysville
placer, Au, Sn

YUBA MNG CO

2051 Santa Clara Ave, Alameda
Pres: J J Farley
VP: A E Parker
Sec-Treas: Denby S Colfax
YELLOW JACKET MINE, PO
Box 1, Kelsey, El Dorado
County, undergr., Au, Ag
Gen Supt: Ray A Grates
Geol: S T Hilberg
Mech Eng: B F Gregg
Mine Frnt: Uno Gustafson
Prod: 40 tons
M-TON FLOT-GRAY MILL,
at mine
Mill Supt: G E Hiller
Asst Supt: Jas A Stater

COLORADO

ACE TURNER URANIUM
CORP

Box 1801, Grand Junction
ECONOMY NO 1 MINE, Mesa
UO₃

AJAX URANIUM CORP

1306 Cherokee St
Denver 4
Pres: T J Weaver
VP: H W Woodruff
Sec-Treas: Frances K Waggoner
73 CLAIMS, San Miguel County
UO₃
Geol: T J Weaver
Under devel

AMENT & BERRY

Naturita
MINE, UO₃

ALLIED CHEM CORP
(GEN CHEM DIV)

40 Rector St, New York 6, NY
or PO Box 78
Morristown, NJ (Mng Dpt)
Pres: I H Foshee
VP: F J French
Purch Agt: J A Simpson
Mgr Mng Oper: Wilbert J
Trepp

Asst Mgr Mng Oper:
J R Pennington

Geol: Harry E Pattuck
BURLINGTON MINE, James-
town, Box 228 Boulder, under-
gr., CaF₂

Gen Supt & Met: Glen E Allen
Main Mech: A G McGown
Mine Frnt: Jack Mann
Prod: 150 tons per day

150-TON FLOT MILL, Valmont

Mill Frnt: T J Hinshaw
Asst Met: G Everett Allen
(See NV, Va, NJ)

ALOWOO, E J

Box 234, Naturita
DIANA MINE, undergr
UO₃, V O₃
Prod: 10 tons per day

ALTAMONT MNG &
URANIUM INC

50 E 10th St, Bountiful, Utah
Pres: Geo Schultz
VP: Thomas Reese
Sec-Treas: Leo L Ralph
MINE, near Gunnison
Under devel
Mine Eng: RHT Dunsmore
(See Utah, Nev)

ALVANO, CLAIR

Box 523, Nucia
LARK LEIGHTON GR MINE,
Montrose Co, UO₃

AMBASSADOR OIL CO

3101 Winthrop Ave,
Fl. Worth, Texas
MINERAL PARK NO 4 MINE,
Montrose Co, UO₃

AMERICAN BERYL CORP

2257 S Zenobia, Deaver
MINE, pegmatites

AMERICAN EAGLE
LEASING

Norwood
MINE, UO₃

AMERICAN GILSONITE CO

Municipal Airport, PO Box 15
Salt Lake City, Utah
Pres: E F Goodner
VP & Gen Mgr, Prod: R E Helms

Sec-Treas: E H Owen
COKE PLANT-REFINERY,
Glimanite
Supt: J L Boyce
Mgr: L P Morris
(See Utah)

AMERICAN LEDUC URANIUM

200 N 6th, Grand Junction
HENDERSON #1, ECONOMY #2,
OUTLAW MESA, JEAN, OUT-
LAW #5 & #16, & PEACH #10
MINES, Outlaw Mesa area,
Mesa Co, U₃O₈
PROPERTIES, Moffat County
U₃O₈

AMERICAN SMELTING & REFINING CO

405 E 5th Ave
Denver 16
Mgr: J Paul Harrison
ARKANSAS VALLEY PLANT, Pb
Box 973, Leadville
Supt: L C Travis
Asst Supt: F A Desantis
Metallurgists: M D Rood, R
Enochs, Q Cohenour
Master Mech: C Hopfinger
Chief Acct: Edward J Kelly
Safety Eng: Frank E Stevens
Plant Eng: R L Armbruster
Ch Assayer: R J Elliott
Ch Chem: Max Kasten
GLOBE PLANT, Denver, Cd
Supt: W L Miles, Jr
Asst Supt: Max Conlee
Safety Insp: J J Ryan
See Ariz. Calif. Idaho, Ill, Md,
Mont, Nebr., N.J., N. Mex., N.Y.,
Texas, Utah, Wash.,
& Federal Mng & Smelting Co
(See)

AMERICAN WESTERN METALS CO

187 Montgomery St, #402
San Francisco, Calif.
DEPRESSION 2 & 3 MINES,
Mesa Co, U₃O₈

AMPET CORP

933 Colorado Bldg, Denver
Pres: R A Gus Davis
VP: Robert J Paul
Sec-Treas: Alfred O Brehmer
MINE, U₃O₈
Prod
(See Arizona, Utah)

ANDRESS, CLYDE & ASSOC

Placerville
PAYROCK MINE, Mesa County
UV

ANDREWS, K M & D K

Box 87, Nucla
RADGER MINE, undergr, U₃O₈
V₂O₅
JUPITER MINE, Gunnison Co
U₃O₈, Ca
Under devel
PRINCESS MINE, Montrose Co,
U₃O₈, V₂O₅, undergr

ANSCHUTZ DRILLING CO INC

141 Mile High Center Bldg
Denver
Pres: Fred B Anschutz
VP: J H Casler
Geol: Louis A Gas
Gen Supt: Fred C Hohre
AMERICAN EAGLE MINE
Gypsum Valley, undergr, open
pit U₃O₈
Mine Supt: W W Lyon
Prod: 30 tons
(See Utah, Wyo)

ARAPAHOE MNG & URANIUM ORE CORP

1825 Gilpin, Denver
Pres: Ralph M Stuck
MALACHITE MINE, Jefferson
County, undergr, open pit, Cu

ARBOGAST, H L

Rt 4, Grand Junction
U₃O₈ Prod

ARGO MNG CO

Box 1807, Grand Junction
LOST DUTCHMAN MINE,
Beaver Mesa, Mesa County,

undergr U₃O₈, V₂O₅
Gen Mgr: Lyle F Campbell
Mine Frm: William M Rash
Prod: 70 tons

ARGYLE MNG & MLC CO

2637 S Dexter St, Denver 22
Pres: J Cameron Grant
VP: John W Gaske
Sec-Treas: Alfred O Brehmer
PRIDE, OSCEOLA &
HEMATITE MINES, Silverton,
San Juan County Pb, Zn, Cu,
Ag, Au, Hematite, undergr,
Gen Mgr: J Cameron Grant
100-TON MILL, Howardsville
Mill Supt: Aldo Bonavida

ARKO, LOUIS

Box 728 Canon City
SPIKEBUCK MINE, Fremont
County, pegmatites
Under devel

ATLAS MNG & MFG CO

409 Main St, Delta
MINE, Delta County, Fe, S

B & B MNG CO

Box 182, Naturita,
SUN DOWN GROUP MINES,
U₃O₈

B E C MNG CO

Box 371, Paradox
VALLEY VIEW 1 & 2 MINES,
U₃O₈

BACHELOR MINES

Dove Creek
MINE, San Miguel County
U₃O₈

BAIRD & SNYDER MNG CO

Dove Creek
DOLORIS, MIDSEY No 1 MINES,
San Miguel Co, U₃O₈

BAKER GRAHAM INTERESTS

PO Box 7044, Reno, Nev
MINE, U₃O₈
Idle

BALD EAGLE MINING CO

700 Main Street, Montrose
MINE, U₃O₈

DELBERT W BARKER

PO Box 263, Nucla
MINE, U₃O₈

BARLOW, WILLIAM S

Dove Creek
MINE, San Juan Co, Utah
U₃O₈
(See Utah)

BARRETT MNG CO

Box 305, Dove Creek
MINE, San Juan Co, Utah
U₃O₈
(See Utah)

BEAL & ASSOC

c/o Robert W Beal, Green Mt
Falls
MINE, CaF₂
Under devel

BEAVER MESA URANIUM INC

PO Box 347, Grand Junction
Pres: Alan M Simpson
VP: Julian E Simpson
Sec. Treas: Mark Holloway
BAJAH-CHEROKEE-MARK II
Gateway mng dist, undergr,
U₃O₈, V₂O₅
Gen Mgr: Alan M Simpson
Mine Supt: Henry Lehr
Prod: 225 tons

BEERS, SIDNEY J

Naturita
PEGGY 1 & 2, PEGGY & RUSTY
NO 5 MINES, U₃O₈

BENTLEY, WALTER

Silverton
KITTIMAC MINE, San Juan
County, Au, Ag,
Under devel

ERNEST BERRY

Naturita
MINE, U₃O₈

BERYL ORES CO

W 100 Ave & Alkire St
Arvada
Pres & Purch Agt: Michael
D Lyons
VP Sec-Treas: F Marchionese

MICA GRINDER, Jefferson
County, open pit, beryl, mica
3-TON-GROUNDING & SINTERING
MILL, Arvada

BERYLLUM CORP OF AMERICA

415 Symes Bldg, Denver 2
Shirley Group of Claims, Use
Trail, Beryl

BIG RED

PO Box 751, Canon City
MINE, U₃O₈

BINDER, F V

Naturita
CLUB SANDWICH & NUCLA
MINES, Montrose Co, U₃O₈

BLACK EAGLE MNG CO

Box 717, Idaho Springs
BLACK EAGLE, Clear Cr, Pb
Zn
Under devel

BLACK GIRL MINES CO

271 N Monterey Rd
Palm Springs, California
VP: J M McFadden
BLACK GIRL MINE, Ouray,
undergr, Ag, Cu, Pb, Au
RED MT MINE, Red Mt,
undergr, Ag, Cu, Pb, Au
Gen Mgr: J M McFadden
Geol: Dr C M Shaw
Idle
(See Calif)

BLIXT & HUNTER MINE & MLC

Box 123, Telluride,
Part: Dan F Hunter Jr
Oscar E Blixt
BURRO GROUP MINE, Au, Ag
Cu

PINTO MINE, Ag, Pb

WATERFALL MINE, Pb, Ag
SAN JUAN MINE, Ag, Pb
Under devel

GRAV-BRIDAL VEIL BASIN

MILL, 4 tons per hr
OLD OVER MILL
Prod: 1 tons per hour

MATTERHORN MILL

Under devel
BLUE CREEK MNG CO
c/o Esther S Crane
PO Box 286, Astoc, N Mex
U₃O₈ Prod

BLUEBIRD MINES

Nederland
BLUEBIRD MINE, Nederland
Boulder County, undergr, Ag,
Pb, Au, Cu
Under devel
MILL, Blackhawk
Idle

BOLLES BROTHERS

1415 N 15th St, Grand Junction
DEPRESSION NO 5, Flat Top,
U₃O₈, V₂O₅

BOOTSTRAP, INC

PO Box 551, Salida, Colo
Pres: Cecil Weston
VP: C I Munkit
Sec: J B Strickland
Treas: W J Manthorn
Res Mgr: O Munkit, Jr
MINE #1 & 2, Howard, open
pit, Cu, Au, Ag, Pb, Zn, Ti
Lepidolite
Pit Frm: R G Parks
Prod: 25 tons daily
FLOT-GRAY MILL, 603 W 7th
Salida, pilot mill
Prod: 25 tons daily

BOWLES MNG CO

587 N 24th St, Grand Junction
RUDOT MINE, U₃O₈

BRIDGER JACK INC

130 W Main St, Grand Junction
BCH SEC 1 & BRIDGER JACK
MINES, San Juan Co, Utah
U₃O₈
(See Utah)

BEN BRITO

Naturita
MINE, U₃O₈

BROOKS & NEILSON

Naturita
MINE, U₃O₈

BROWN MINES

PO Box 242, Montrose
MINE, U₃O₈

BUCKSKIN JOE MINES, LTD

Alma
Gen Mgr: C W Jordan
PHILLIPS MINE, undergr, Au
Ag, Cu, Pb, Zn, Fe
Idle

PHIL BUNKER MINING CO

PO Box 277, Nucla
MINE, U₃O₈

BURNETTE, HUEY F

3500 Main St, Durango
BURNETTE #5 MINE, Long
Park Area, Montrose County,
undergr, U₃O₈, V₂O₅
Gen Mgr: Grant H Huntley
Mine Frm: Paul P Faverjon
Prod: 30 tons
(Leased from Vanadium Corp
of Amer)

BURNWELL MINING CO

Dove Creek
MINE, U₃O₈

BURRELL, DOROTHY

Merker
UTE MINE NO 3, U₃O₈

C Y A C MNG & DEVEL CO, INC

Box 631, Salida
CYAC MINE, Antero Mtn,
Beryl

CADWELL MNG CO

c/o Vernon L Phillips
3285 Cody St, Denver 15
Pres: R E Sober
VP: Vernon L Phillips
Sec-Treas: Frank L Dougherty
HAYDEN SHAFT, Leadville
undergr, Ag, Pb, Zn, Mn
Idle

CAL N CO URANIUM CORP

Box 268, 201 Elec Bldg,
Grand Junction
CEDAR CLIFF GROUP MINE
U₃O₈

CALAMITY CREEK URANIUM CORP

Grand Junction

COTTONWOOD MINE,

U₃O₈

CAMP BIRD COLO INC

Suite 210, 1st National
Bank Bldg, Denver 2
Pres: C Maxwell Norman
VP: C P Tremlett
Sec: D C Dorkes
CAMP BIRD MINE, Ouray, Pb
Ag, Zn, Cu, Au
Geol: C Bruce
Mgr: D Hutchinson
Mech Eng: John Ives
Eng: H K Loeschel
Mine Frm: H Bartlett
Mine Eng: H Donatti
Under devel
(See NY)

CAMPBELL, JESS

Naturita
BALD EAGLE, ROOSEVELT
AND RAVEN MINES, San
Miguel and Montrose Counties
U₃O₈

CAMPBELL, LYLE F

Box 1698, Grand Junction
BONANZA ADIT NO 3,
Calamity Mesa, U₃O₈, V₂O₅

CANFIELD, ARTHUR

Box 1649, Grand Junction
MNG LEASE NO 8, San Miguel
Co, U₃O₈

CANON DEVELOPMENT CO

PO Box 350, Canon City
MINE, U₃O₈

WM J CAREY MNG CO

1801 First Natl Bank Bldg
Denver 2
Pres: William J Carey
Mgr: Harry E Hayee
Dist Geol: Dolf W Fieldman
(Climax Uranium Co, Lessee)
(See Ariz)

CARTER, CLIFFORD

Urasan
HORSEHAIR NO 1 MINE, U₃O₈
BETTY JEAN MINE, U₃O₈

CASTOR, BOYD

Naturita
SUNRISE #2 & #3, Corral
Draw, U₃O₈

CASTOR, MILTON

Naturita
BLACK ROCK MINE & SUNRISE
NO 5 MINE, U₃O₈
CENTURY MINING &
DEVELOPMENT CO
235 256 Raymond Blvd
Newark 3, New Jersey
MINE, U₃O₈

CHAMPION MINES CO

1742 Sherman St, Denver 2
Pres: Jack H Smith
VP: C R Reglin
Sec: D F McDermott
MORNING STAR & LAST
CHANCE MINES
LEASES ON JERRY JOHNSON,
WPH & FOREST QUEEN MINES,
Cripple Creek, undergr, Au
Idle

CHAPIN, LOUIS A

Placerville
PIE FACE NO 1, Mesa Co,
U₃O₈

CHEROKEE MINES

3315 Grant Ave, Ft Collins
Pres: T H Sackett
VP: V E Cram
Sec-Treas: Jas H Andrews
BLACK HAWK #1 & 2 MINES
undergr, U₃O₈
Gen Mgr: T H Sackett
Idle

CLEAR CREEK MNG CO

1727 Boulder St, Denver 11
Pres: Donald F Farris
VP & Gen Mgr: Alfred O Hoyt
Sec: Earl H Ellis
LAKE CENTRAL MINE, Idaho
Springs, undergr
(Mine operated by Contract
Engineering Co)
Under devel
Gen Supt: George R Kyler

CLIFF & CREEK URANIUM CO

447 Independence Bldg
Colorado Springs
CHARLES AVERY, CLIFF &
CREEK, GEORGE AVERY,
MINERAL RIGHTS MINES
Pueblo Co, U₃O₈

CLIMAX MOLYBDENUM CO (A Divn of AMERICAN METAL CLIMAX, INC)

Climax
Pres: Frank Coolbaugh
Sec: E A Weil
Treas: Donald Genshine
Purch Agt: J E Russell
CLIMAX OPERATIONS, Climax
Gen Mgr: Wade Orr
Robert Henderson
Res Mgr: Edwin J Ebenach
Gen Supt: John Petty
Asst Gen Supt: F J Wundolph
Geol: Stewart Wallace
Elec Engr: U F Toucher
Mech Engrs: J Macintyre,
W R Allan
Met. Wm Gregory
Chf Mgr: Max Gelson
Pb Engrs: M S Walker
MINE, undergr, MoS₂, WO₃,
FeS₂, Sn
Mine Supt: William Dostler
Asst: Mine Supt: C A Cleaves,
Joffre Johnson
Mine Frm: Dale Johnson,
Jas Ludwig, A W Nelson,
Cecil Smith
Mine Engr: Horace Ham
Prod: 13,000 tpd
33,000 TON FLOT-GRAY MILL
Climax
Mill Supt: Fred J Hoff
Asst Mill Supt: Jas Shore
Mill Frmt: Fred Bender
Ch Chem: Robert Ziegler
(See N Y)

CLIMAX URANIUM CO, (SUBSID OF AMERICAN METAL CLIMAX INC)

Box 1901, Grand Junction
Pres: Frank Coolbaugh
VP & Gen Mgr: A M
Mastravich
Purch Agt: L J Mann
Consult: E J Duggan
Asst Treas: A H Eikenbary
Asst Sec: J D Carnahan
MINES, near Grand Junction
undergr, U₃O₈, V₂O₅
Mgr Mines: L J Brewer
Prod Supt: T E McCandless
Prod: Andy O'Kern
E D Bieber, E A Roberts
Ch Geol: Phillip Domsrath

Geol: R P Darnell, Robert Nakache, Roland Warner
CHEM MILL, Grand Junction
 Plant Mgr: R C Torgner
 Mill Supt: Paul Wier
 Master Mech: G K Burnhart
 Ch Met: R E Musgrove
 Ch Chem: Q S Kocher
 (See Ariz, NY, Utah)

CLINE, LEO & CO
 % Robert L Parent
 421 Glenwood, Grand Junction
 MINE, at San Rafael Reef,
 Emery Co, Utah, U₃O₈
 (See Utah)

HARRISON S COBB
 461 Pine, Boulder
 MINE, U₃O₈

COCHRAN URAN CO
 Rt 2, Grand Junction
BUBBLES MINE, Montrose
 Co, U₃O₈

COG MINERALS CORP
 Denver Club Bldg, Denver
 Pres: W C Norman
 VP: J H Nason
 Sec: C W McDermott
 Treas: D F Taylor
 Oper Mgr: Frank A Setton
 (See Calif, Utah)

COLE, JOE
 Naturita
PATY NO 5 MINE, Montrose
 Co, U₃O₈

COLE MITCHELL & WHITE
 Naturita
WHITE COW MINE, Montrose
 Co, U₃O₈

COLO AGGREGATES CO, INC
 Mesita
 Pres: Geo M Oringdolph
 VP: W W McClintock
 Sec-Treas: Henry Quiller
MESITA HILL MINE, 2 mi W of
 Mesita, surface, volcanic
 conics
 Gen Mgr: Geo M Oringdolph
 Frnt: Robert Compton
 Prod: 180 tons

COLORADO BERYLLIUM CORP
 Suite 35, 155 N College Ave
 Fort Collins
 Pres: John M Phillips
 VP: Hon Thomas P Brady
 Sec-Treas: Lloyd J Sison
COLORADO BERYLLIUM CORP MINE, Crystal Mt area,
 20 mi SW of Fort Collins, Mica
 Feldspar, Be
 Gen Mgr: John M Phillips
 Gen Supt: Charles Stafford
 Geol: Warren E Hofstra
 Idle

COLO FUEL & IRON CORP
 Continental Oil Bldg, Denver
 Pres: A F Franz
 Sec: D C McGrew
 Treas: H C Crout
MINING DEPT, Box 316, Pueblo
 VP, Oper: J J Martin
 Dir, Purch: L C Rose
 Mgr, Mines: R R Williams Jr
 Ch Eng: Ming Dept
 W J Schreier
 Ch Geol: D A Carter
MONARCH QUARRY, Limestone
 Saline
 Supt: J E Whitney
 Prod: 3000 tons
CANON DOLOMITE QUARRY,
 Canon City
 Supt: E C Jagow
 Prod: 325 tons
 (See Utah, Wyo)

COLO PLATEAU URANIUM CO
 824 Equitable Bldg, Denver
KOLONEL SELLERS, Summit
 Pk, Zn
 Under devel

COMMERCE MNG CO
 509 Olive St., St Louis 1, Mo
MINE, Leadville, undergr,
 Pb, Zn, Au, Ag
 Geol: H F Mills
 Idle
 (See Mo)

"COMIN CO" CO-OPERATIVE MNG CO LTD
 PO Box 317, Dove Creek
 Pres: Magary E Skeels
 Sec-Treas-Purch Agt:
 Hal C Skeels

"COMIN CO" COPPER MINE NO 1, Wet Mt Valley, Slick Rock
 Mng Dist, Cu
 Gen Mgr: Hal C Skeels
 Prod: 100 tons per month
 Under devel

"COMIN CO" COPPER MINE NO 2, Paradox Valley, undergr,
 Cu, Ag
 Gen Mgr-Mng Eng: Hal C Skeels

Asst Gen Mgr: W D Trip
 Gen Supt: James E Beck
 Mech Eng: Preston D Baker
 Prod: 50 tons per day
 Under devel

CONTINENTAL MATERIALS CORP (FORMERLY CONTINENTAL URANIUM INC)
 820 Ninth St S, Grand Junction
 Pres: Willard Oldewitz
 Sec: Max H Braun
 Bd Chem: Gerald Oldewitz
 Gen Supt: C H Reynolds
 Under devel
 (See Utah, Wyo)

CONTRACT ENGINEERING CO
 1727 Boulder St., Denver II
LAKE CENTRAL PROJECT,
 Idaho Springs, Au, Ag, Pb

COOLEY GRAVEL COMPANY
 618 Lowell Blvd, Denver 21
 Pres: C G Cooley
 VP & Gen Mgr: E J Wemlinger
 Sec-Treas: D G Hughes
COOLEY GRAVEL PIT, Adams
 County, Au, Ag
 Mech Engr: H O Enderud
 Mine Supt: J B Cooley
 M R Williams, Wm G Adams

CORDILLERA CORP
 11 Seaboard Bldg, Seattle I
 Wash
LING GRP, Park, Summit, Pb
 Zn
 Idle

CORDILLERA MNG CO
 POBox 664, Grand Junction
LIBERTY BELL NO 1, Mesa Co,
 U₃O₈

COSTELLO LEASE
 Bonanza Rl, Villa Grove
 On W J Costello
RAWLEY MINE, Bonanza,
 20 mi N of Villa Grove,
 undergr, Pb, Zn, Ag, Cu
 Prod: 50 tons

COTTER CORP
 POBox 751, Canon City
 Pres: Parker Wilson
 VP: David P Marcott
 Sec-Treas: R J Gaskin
 Purch Agt: Wesley K Carhart
MINE, undergr, open pit,
 U₃O₈, ThO₂
 Gen Mgr: David P Marcott
 Mine Supt: C Swath
506-TON CARBONATE LEACH URANIUM MILL
 Mill Supt: Glen E Hanson
 Mill Frnt: Guy Winslow
 Assayer: Myles Fixman

CECIL CRANDALL
 Redvale
MINE, U₃O₈

CROWN MNG CO
 Box 664, Grand Junction
BLACK MAMA MINE, Mesa
 Co, U₃O₈
LIBERTY BELL MINE, U₃O₈
CORVUSITE MINE, U₃O₈

D & J URANIUM & EXP-LORE CO INC
 219 Bon Durant Bldg, Pueblo
 Pres: Russell L Jewett
 Sec: Chas M Warner
 Treas: Seamon A Jewett
 Dir: Glenna A Sander
 Sales Mgr: George J Schmitt
BONITA MINE, Pueblo, undergr,
 U₃O₈
 Eng: Walter Burleson
 Under devel

DALCO URANIUM, INC
 Uranium Center Bldg,
 Grand Junction
 Pres: E Roosevelt
 VP: J Connor
 Sec: David Cross
 Gen Mgr: J Connor
 Gen Supt: A H Beldo
 (See N Mex)

MARIO DALPEZ
 Norwood
MINE, U₃O₈

W L DAVENPORT & DR FF GROSS (Operator)
 Box 183, Breckenridge,
MINNIE MINE, 3 mi E of
 Breckenridge, Summit County,
 Au, Ag, Pb, Zn
 Idle

ECKMAN, W B
 Naturita
U₃O₈ Prod

EGGERS, C
 Dove Creek
DOLORES APRIL MINE,
 Slickrock dist, San Miguel
 County, undergr,
 Prod: 20 tons

FRANK ELDER
 Naturita
MINE, U₃O₈

ELKTON GOLD MNG CO
 Box 127, Cripple Creek
ELKTON GROUP, Teller
 Au, Ag
 Under devel

EMMONS MINING CO
 Naturita
MINE, U₃O₈

EMPERIUS MNG CO
 Emperius Bldg, Creede
 Pres: T B Ponson
 Treas: H B Hayden
 Gen Mgr: T B Ponson
EMPERIUS MINE (ROBINSON & AMETHYST), 1 1/2 mi N of
 Creede, undergr, Pb, Zn, Ag,
 Cu, Au
 Mine Supt: T B Ponson
 Mine Frnt: T J Phillips
 Prod: 120 tons
150-TON FLOT MILL, 1 mi S of
 Creede
 Mill Supt: H S Wheeler
 Asst Mill Supt: W P Mitchell
 Assay: Gordon Noeslhus

EMPIRE LEB MNG CO
 Box 127, Cripple Creek
ISABELLE MINE, Teller
 Au, Ag
 Under devel

EQUITABLE URANIUM CORP
 127 Cooper Bldg, Denver
 Pres: Melvin C Bowles
 VP: A L Hefflin
 Sec: Glenn C Leader, Jr
GOVERNOR MINE & CLAIMS
 Box 352, Bishop Canyon,
 Slick Rock Mng dist, undergr,
 U₃O₈, V₂O₅
 Gen Mgr: Melvin C Bowles
 Supt: Vernon K Bowles

ESTES, W & SONS
 Uravan
BLACK MAMA, Mesa Co,
 U₃O₈
LIBERTY BELL, U₃O₈

ETA BETA
KEN DORNEY
 4575 So Lincoln St,
 Englewood
MINE, U₃O₈

ETA MINES
 317 Main, Grand Junction
 Part: Frank L Seymour,
 Vernon Pick & Jim Martin
RAE MARIE MINE, 10 mi W of
 Gateway, undergr
 Mine Supt: James F Martin
 Under devel

EUREKA TUNGSTEN CO
 3255 S Cherokee St,
 Englewood
 Part: John S Keifer, E B Ralston
EUREKA MINE, Sugar Loaf mng
 dist, Boulder County, undergr,
 W₂O₃
 Gen Mgr: E B Ralston
 Idle

FIBREBOARD PAPER PROD CORP
 (Pabco Bldg Materials Div)
 PO Box 365, Florence
COALDALE QUARRY, Florence
 open pit, gypsum rock
 Mine Supt: T E Barton
 Prod: 250 tons per day
 (See Calif, Nev)

DAVIS & GOFORTH
 Dove Creek
JIM MINE, San Miguel Co,
 U₃O₈

DEAL MINING COMPANY INC
 Box 392, Ft Collins
 Pres: Arthur G Wykert
 VP: Melvin A Wykert
 Sec-Treas-Purch Agt:
 Frank G Hooper
JODY MINE, Blue Mesa Mng
 dist nr Uravan, undergr,
 open pit, U₃O₈, V₂O₅
 Mine Supt: Melvin A Wykert
 Asst Mine Supt: Arthur G Wykert

DENVER-GOLDEN CORP
 1826 First Natl Bank Bldg
 Denver
 Pres: Charles O Parker
 VP & Gen Mgr: G H Brodie
 Sec: Roy O Goldin
 Treas: Barney Janow
SCHWARTZWALDER MINE
 Ralston Creek, Box 109
 Golden, Jefferson County,
 undergr, U₃O₈
 Mine Supt: E C Rice
 Asst Mine Supt: Clyde I True
 Geol: Allan G Bird
BURBANK TUNNEL, Ag, Au

DEVEREAUX BROTHERS
 Box 373, Meeker
BURRELL MINE, Rio Blanco
 Co, U₃O₈
COAL CREEK NO 1, U₃O₈
MARVIN VIEW MINE, U₃O₈

DIATOMIC CHEM PRODUCTS CO, INC
 1516 Industrial St
 Los Angeles 21
 Pres: Charles L Seymour
 VP: Carmen Eposito
 Sec-Treas: John F Atwell
DIATOMIC MINE, Hay I
 Lompoc, open pit, diatomite
 Gen Supt: D B Stephens

DALE DILLON
 PO Box 143,
 Blanding, Utah
MINE, U₃O₈

DOCTOR JACK POT MNG CO
 Box 127, Cripple Creek
DOCTOR JACK POT MINE,
 Teller, Au, Ag
 Under devel

DODGE, JAMES S
 Aspen
FRYING PAN MINE, U₃O₈
 Idle

DOEPKE MNG CO
 2431 N Nevada Ave
 Colorado Springs
 Mgr: Frank D Doepke
GOLD KING, LEXINGTON, & MATTIE L MINES, Teller
 County, Au
 Under devel

DOUBLE BUCK URANIUM INC
 Egnar
MINE, U₃O₈

M K DOYLE
 Norwood
MINE, U₃O₈

DRILLCO MNG CO
 Escalante, Utah
MINE, in Colorado, U₃O₈
 Under devel

DULANEY MNG CO
 312 First Natl Bank Bldg
 Grand Junction
 Pres: R O Dulaneay
 VP: C H Dulaneay, Harry B
 Friedman &
 F H MacPherson

Purch Agt: Robert B Burns
 Gen Mgr: Frank H MacPherson
 Gen Supt: Leroy Hemphill
 Geol: Philip P Powers
 Mech Eng: Alvie Zurich
RADIUM GROUP OPER, 31
 mi N of Dove Creek, undergr,
 U₃O₈, V₂O₅
 Prod: 1,000 tons

ROBERT LEE DYER
 PO Box 315, Naturita
MINE, U₃O₈

EAST RIDGE CO
 Box 559, Ouray
 Pres: Carlton E Byrne
 VP: F Moldenhauer
 Sec: Alice Davenport
ANDRUS MINE, 4 mi W of Red
 Mt Pass, undergr, Zn, Pb,
 Cu, Ag, Au
 Gen Mgr: Philip V Doyle
 Under devel
 (See Calif)

FLANDERS MNG CO
 (See Pacific Industries, Inc)

JOSIE K FOLSON MNG & MFG CO, LTD
 4280A Holly Ave, St Louis 15
 Missouri
 Pres: Oscar F Huegal
 Sec-Treas & Purch Agt:
 Fred W Kublin

JOSIE K FOLSON MINE,
 Saguache County, undergr, Au
 Ag
 Gen Mgr: Fred W Kublin
 Idle

FOOTHILLS MINING CO
 3240 6th St, Boulder
MINE, U₃O₈

FORCE HILL MINES INC
 Box 824, Idaho Springs
 Pres: Aslier R Smith
 VP: C E Morrison
 Sec-Treas: Wilfred Roberts
FAIRMONT & FAIRMONT EXT:
 Virginia mng dist, undergr Pb
 Ag, Zn, Cu, Au
 Mine Supt: C E Morrison
 Idle

FOSTER, HERBERT
 1217 Colorado Ave, Grand
 Junction
MESA NO 5, Mesa Co, U₃O₈

FOSTER, RALPH & SONS
 1217 Colorado Ave
 Grand Junction
SNOWSHOE, MESA #5 & #6,
 MINES, Outlaw Mesa, U₃O₈,
 V₂O₅

FOUR CORNERS EXPLORATION CO, INC
 Box 116, Grants, N Mex
BACHELOR MINE, San Miguel
 Co, Colo, U₃O₈
DREAMER-GOOD HOPE,
 Fremont Co, U₃O₈
LUCKY JIM MINE 1-2-3, Park
 Co, U₃O₈

FOUR CORNERS OIL & MINERALS CO
 1700 Broadway, Denver 2
 Pres: D M Hillis
 Sec: T J Murphy
LION CREEK & GREEN RIVER MINES, undergr, U₃O₈ (Bull
 Canyon Group)
 Gen Supt: W R Bronson
 Mng Eng: Rex Smith
 (See Utah, Wyo, & Large
 Uranium Corp, N Mex)

FOY & DAVIS MINING CO
 Dove Creek
MINE, U₃O₈

FOUR STAR EXPL CO INC
 523 N 4th St, Canon City
MINE, U₃O₈
 Under devel

LYLE G FRANCIS
 PO Box 264, Moab, Utah
MINE, U₃O₈
 (See Utah)

FREELAND EXTENSION 1353
 Box 721, Idaho Springs
 Pres-Treas-Own: Eva A Lear
 Purch Agt-Own: Frank Lear
FREELAND EXTENSION 1252,
 Trail Creek, undergr, Au, Ag
 Cu, Pb
 Under devel

THE FRITZ ERICKSON MNG CO
 PO Box 365, Dove Cr,
JACKIE WALLS 1-4 MINE,
 U₃O₈
S S GROUP MINE, U₃O₈
TAILHOLT MINE, U₃O₈

FRONT RANGE MINES INC

Burns Vault Bldg., Denver
Pres & Gen Mgr: John Decker
VP: Paul R. Spencer,
Robert & Mitchell
Sec-Treas: H. P. Macaulay
MATTIE MINE, Clear Creek
County, Pb, As, Ag
Idle

MELVINA MINE, Boulder
County, As
Idle

STRONG & MARY CASHER
MINES, Teller County, Au
KING SOLOMON GROUP
Idle

CLEAR CREEK MILL, Dumont
flot
Capacity: 200 tons

FURSTENBERG BROTHERS

878 Cook St., Denver 8
STANLEY TUNNEL, Spanish
Bar, Au, Ag, Pb

G B L COMPANY

812 Emporia St., Aurora 8
Pres: F. Vernon Griffith Jr.
VP-Purch Agt: A. P. Lancy
Sec-Treas: John P. Lake
FIGHTERS FRIEND &
GEM LODGE, Idaho Springs,
undergr., Au, Ag, Pb, Cu
Gen Mgr-Mine Supt: A. P. Lancy
Gen Supt-Assnt Mine Supt:
George Prime
Geol: Paul Bonham
Mine Frnt: Paul Bonham
Mine Eng: M. T. Biggs
Prod: 10 tons
(See Mo)

GADDIS MNG CO

Suite 1500, 1700 Bway Bldg.
Denver 17 Nat'l Bank
Center, Denver
Pres & Treas: W. H. Gaddis
Sec: Loren E. Smith
ELK PARK MINE, Silverton
San Juan County, undergr.,
U₃O₈
Under devel

GARDNER & SON MNG CO

Box 505, Grand Junction
CALAMITY NO 6 & NO 10
Calamity Mesa, U₃O₈, V₂O₅

GAYNO MNG CO

500 Brown
Box 547, Montrose
GAYNO GROUP & LEASE
#46 MINES, San Miguel Co.,
U₃O₈

GENERAL MINERALS CORP

440 Meadows Bldg., Dallas
Texas
WILD STEER NO. 8 MINE,
Montrose Co, U₃O₈

GENERAL MINE & MFG CORP OF COLO

833 E. Platte Ave.
Cale Springs
HAMLETT NO 1 & 3 MINES,
Grant Co., N. Mex., Fe
(See N Mex)

GIANT CYCLE CORP

Box 68, Carlton Bldg.
Colorado Springs
Pres: Merrill E. Shoup
Exec VP & Gen Mgr: Max W.
Hawen
Asst Gen Mgr: G. Murray
Sec: H. Bates
Treas: John Jacobs, Jr.
Under devel
(See S D)

GIBBONSVILLE PREMIER GOLD MINES, LTD., INC

620 Fernwell Bldg., Spokane
Wash
Pres: H. M. Vasey
Mgr: E. C. Burnaby
Sec: S. Edelstein
MINE, Gibbonsville, Au
Idle
(See Wash)

GIBALTAR MINERALS CO

Box 35087, Dallas 35, Texas
LOOKOUT GROUP MINES,
Saguache Co, U₃O₈

GLOBE HILL MNG CO

325A Independence Bldg.
Colorado Springs
Pres: H. J. Anderson

VP: R. W. Beal

Sec-Treas: R. B. Murray
Asst Secy: Julia Davison
PHONOLITE MOUNTAIN
URANIUM MINE, Cripple Creek,
open pit, U₃O₈, Antioite
Asst Gen Mgr: Stan Balcomb
Gen Supt: George West
Geol: T. W. Anderson
Mech Eng: Lloyd Collard
Asst Mine Supt: L. D. Anderson
Mine Frnt: Earl Robush
Under devel

GLOBE MNG CO (Unit of Union Carbide Corp)

Grand Junction, Box 1049
(See Wyo)

GOLD CREST MNG CO

Box 351, Crested Butte
Pres: R. F. Magor Jr.
CP: R. F. Magor, III
SKYLINE #1 & PAINTER BOY,
open pit, placer, Au, Ag, Pb
Gen Mgr: R. F. Magor, III
Gen Supt: F. Hodgson
Prod: 300 tons
100-TON FLOT-GRAY MILL,
Crested Butte

GOLD ANCHOR MINERALS INC

c/o Doug Watrous, Box 444
Katie Springs
GOLD ANCHOR MINE,
Clear Creek, Au, Ag
Idle

GOLDEN AGE URANIUM CORP

Jamestown
MINE, Gilpin, Au, Ag
Under devel

GOLDEN CYCLE CORP

PO Box 48, Carlton Bldg.
Colorado Springs
Pres: Merrill E. Shoup
Exec VP & Gen Mgr:
Max W. Bowen
Asst Gen Mgr: G. Murray
Treas: John Jacobs, Jr.
Sec: H. Bates
Mines Mgr: Charles Carlton
Purch Agt: Howard Stone
AJAX MINE, Cripple Creek, Au
Supt: Jack Walker
1,000-TON FLOT-CYAN MILL
(Carlton Mill), at mine
Supt: Jim Klein
URANIUM DIVISION MINE,
Aikman
Mesa near Uranian
Supt: T. J. Ballard
MINE, Marysville
(See Utah)

GOLDEN GATE CANYON CO

Lakewood
Pres: Arthur A. Cervi
VP: Sisto Cervi
CERVINI MINE, Golden mine
loc at Golden Gate Canyon,
Jefferson County, undergr., open
pit, U₃O₈
Gen Mgr: A. A. Cervi
Under devel
200-TON MILL, Cotter Canyon
City

GOLDEN SHAFT MINE

Box 333, Central City
Own: Morrison Garrick
Orlando C. Allison
GOLDEN SHAFT MINE, Silver
Creek, undergr., placer, Au, Ag
Cu
Gen Mgr: Morrison Garrick
Asst Gen Mgr: Orlando C.
a
Idle

GOLDSWORTHY, DAVID

Montrose
RAY LEE NO 1, San Miguel Co,
U₃O₈

GOMEZ & CURWELL

Egnar
MINE, U₃O₈

GOODE, TRUMAN

Naturita
RAY LEE NO 1, San Miguel Co,
U₃O₈

GEORGE GRAMBOUCHE

2509 Thomas, Durango
MINE, U₃O₈

GRAPEVINE MINING CO

Morrison
MINE, U₃O₈

OLEN GREAGER

Norwood
MINE, U₃O₈

JACK GREAGER

PO Box 72, Norwood
MINE, U₃O₈

GREAT LAKES CARBON CORP

PO Box 308, Antioite
MILL, Antioite
Mill Supt: A. K. Muir
(See Calif., Nev., N. Mex., Ore)

GREAT WESTERN AGGREGATES, INC

808 Boston Bldg., Denver
Opt: Ernest W. Munroe
GOODWIN QUARRY, surface
gypsum
Idle

GREEN RIVER OIL & URANIUM CO

34 W. Broadway #1
Salt Lake City, Utah
Pres: F. L. Kelly
Sec-Treas-Purch Agt:
Austin B. Smith
VANADIUM QUEEN
PROPERTIES, San Miguel
County, undergr., U₃O₈
VANADIUM QUEEN MINE, Gas
Hills Area
Leased to Carl Weaver, Grand
Junction, mng oper by Lucky
Mc Uranium
(See Wyo, Utah)

GRIPE, WOODROW E (Lessor)

Box 225, Naturita
EARLY MORNING, Big Gyp Valley
undergr., V₂O₅, U₃O₈
Prod: 2 tons
WALLEY'S CLAIM, Slickrock
dist., V₂O₅, U₃O₈
Prod: 10 tons

BALD EAGLE, MORNING GLORY AND SARAH ELLEN MINES, San Miguel Co, U₃O₈**GUNNISON MINING CO**

Box 539, Gunnison
Pres: Geo. A. Hicord, Jr.
VP: Dr. Garth W. Thorsburg
Sec-Treas: Duffy Salinger
Purch Agt: William R. Johnson
LOS OCHOS MINE, approx 23 mi
SE Gunnison, undergr., U₃O₈
Gen Mgr: John L. Robinson
Mine Supt: Leslie C. Ross
Geol: Coy M. Mobley
Asst Mine Supt: F. D. Kolklich
Mine Frnt: William R. Green
Mine Eng: Ralph Williams
Prod: 400 tons daily
400-TON SOLVENT EXTRA MILL,
approx 1 1/2 mi SW Gunnison
U₃O₈
Mill Supt: R. E. Shreve
Mill Frnt: F. D. Jackson
Transp Supt: John Trumbo
Maint Supt: Robert A. Rule
Ch Chem: Earl Young
Sec to Pres: Pat Talia
LAST CHANCE MINE,
331 N. 5th, Canon City, open
pit, U₃O₈
Gen Mgr & Geol: Jack Pursley
Prod: 30 tons daily
THORNBURG MINE, undergr.
U₃O₈
Gen Mgr: J. L. Robinson
Mine Supt: Leslie C. Ross
Asst Mine Supt: Frank D. Kolklich
Geol: Mel Mobley
Met: Lincoln Morse
Mine Frnt: Bill Green
Mine Eng: A. Stevens
Prod: 100 tons

VERLE HAMILTON

PO Box 638, Cortes
MINE, U₃O₈

HAMLIN EXPLOR & MNG CO

1013 1/2 E Windsor Rd
Glendale 5
Pres: William C. Hamlin
VP: Robert O. Hamlin
Sec-Treas-Gen Mgr:
Cyde H. Hamlin
HAMLIN-LEDDY MINE, 13 mi
SE of Twenty-nine Palms, San
Bernardino County, open pit,
undergr., Beryllium, Feldspar
Mine Supt: Jack W. Hamlin
Under devel
(See Wyo)

HANNA BASIN CONSTRUCTION & COAL CO

PO Box 9113, Montclair 81
Denver 38
Pres: R. B. Hopkins
VP: C. L. Buckman
Sec: L. G. Burt
Treas: Lorraine C. Pendleton
Met: B. J. Thompson
NUGGET MINE, Box 267, Hanna
Wyo, open pit
Prod: 1500 Tons daily
(See Wyoming)

HENNINGS, SMITH & HUGG

Nederland
LONG SHOT, Boulder County
W₂
Idle

HERD & RUSH

Naturita
MINE, U₃O₈

HESS DRILLING CO

Grand Junction
MINE, U₃O₈

HIDDEN SPLENDOR MNG CO, THE

1st Security Bldg., Salt
Lake City, Utah
GATEWAY PROPERTIES
Beaver Mesa, U₃O₈
Contractor: Charles V.
Woodward
Prod: 750 tons per mo
(See Mont.,
New Mex., Utah, Wyo)

HIDDEN SPLENDOR MNG CO, THE

215 N. 5th, Grand Junction
(See Utah, Mont)

HOLLING, HENRY

PO Box 7, Egner
COUGAR GROUP, San Miguel
Co, U₃O₈

HOLMES, THOMAS W

1831 N. 9th St., Grand Junction
OCTOBER ADIT MINE, John
Brown Mesa, U₃O₈, V₂O₅

HORN & BURGER

Breckenridge
WELLINGTON GRP, Summit,
Pb, An
Idle

J M HUBER CORP

PO Box 831, Borger, Texas
U₃O₈, Prod
Under devel

HUFF MNG CO

1020 Bookcliff, Grand
Junction
BELL GROUP MINE, San
Miguel Co, U₃O₈

HUGHES, C. L

Monh, Utah
FAULT NO 1, Montrose Co,
U₃O₈

HUMPHREYS GOLD CORP

910 1st Nat'l Bank Bldg.
Denver 1
Pres: A. E. Humphreys
VP: I. B. Humphreys
VP: Jay P. Wood (Jacksonville,
Fla)
Sec: W. T. Hostetter
(See Fla)

ALVA HUNT

Rt. 4, Box 87, Montrose,
Owner
BELL & WINDY DAY GROUP,
Lower San Miguel Mining Dist
undergr., open pit, U₃O₈,
V₂O₅
Under devel & Producing

IBEX URANIUM INC

PO Box 950, Montrose
Pres: Theodore L. Bruns
VP: Jack R. Cagle
Sec-Treas: Stewart C. Lee
Geol: Max A. Krey
MINES & CLAIMS, Montrose
& San Miguel Counties, undergr.
U₃O₈
Under devel

IDARADO MNG CO

Curry
Pres: M. D. Banghart
IDARADO MINES, 12 mi SW of
Curay on Red Mt & TELLURIDE
MINES at Pandora, undergr., Cu

Pb, Zn

Gen Supt: John S. Wise
Mine Supt: A. C. Hinder
Ch Chem: John Kearney
Mech Supt: W. L. Griffiths
Ch Eng: Jack C. Keenan
Prod: 1,800 tons
FLOT MILL, Pandora
Supt: K. Taitman
Capacity: 40,000 tons ore per
mo
(See NY)

IRON SPRINGS PLACER

1654 Canon Ave., Grand
Junction
Own: Boyd Robinson
IRON SPRING PLACER MINE,
Ophir, surface, Fe₂O₃
Prod: 10 tons

ISABELL, LESLIE & SON

623 Whipple St., Canon City
TEXAS CREEK RIDGE VIEW
STRIP, Fremont County,
Pegmatites
Idle

JACKPOT OIL CO

Travel Center Bldg.
1640 Court Place, Denver
Pres: Paul R. Clark
VP: Gordon Clark
Sec-Treas: A. M. Bider
BALD EAGLE MINE, Idaho
Springs, undergr., Au, Ag, Pb,
Cu
Gen Mgr: Paul R. Clark
Mine Supt: Roy Walcott
Under devel

125-TON FLOT MILL, Idaho Springs

Mill Supt: Charles Quinn

JOHANNSSEN, E. J. & HALDANE, W. E

Dove Cr.
DOLORES NO 2, U₃O₈

JONES LEAD & ZINC MINES CO

Box 831, Leadville
Oren Robert L. Jones
CARIBALDI MINE, 2 mi E of
Leadville, undergr., Pb, Zn, Au
Ag
Idle

JOSEPH, ED

Norwood
U₃O₈ Prod

JUNIPER OIL & MNG CO

415 C. A. Johnson Bldg.
Denver 2
ARTIC 1-11, DKA-1-10, 10-28,
ELCO 3-7, FORT 1-4, GARDNER
1-3, HASTY NO 1, MOOSE 1-8,
MINES, Fremont Co, U₃O₈

OLIVE 87-88, 91, 97, 101, SNOOPER-DICKSON, SUNRISE 1-9, THORNE CLMS, U₃O₈

placer and open pit
Supt: Chas. J. Lyden

KENDRICK BAY MNG CO

Mines Park, Golden
Pres: Frank Coolbaugh
VP: Everett Jones,
Horace A. Sawyer, Jr.
Sec: John P. Fitz-Gibbon
Treas: Thomas E. Congdon
(See Alaska)

KERKLING & SLENSKER

1800 Dover St., Lakewood
BRANNAN PIT NO 8, 10
F. S. RIZZUTO GRAVEL PIT,
ISLAND 3 & G MINE, Adams
County, Au, Ag
W. P. KERKLING PLACER,
Jefferson County, Au, Ag

KERR-MCGEE OIL INDUSTRIES, INC

Rt. 1, Box 298A
5850 McIntyre Rd., Golden
RESEARCH LABORATORY
Mgr: Mineral Dept. & Research
V. L. Mattson
(See Ariz., W. Mex., Okla., Wyo. &
Kernac Nuclear Fuels, N. Mex.)

KING, ROSS & FRITZ, DONALD

Castle Rock
THREE MUSKETEERS MINE,
Douglas County, Pegmatites
Idle

CARL A. KINSEY

Naturita
MINE, U₃O₈

KLEINKNECHT, EUGENE

Box 56, Bartlett
BEAR CAT, MORNING STAR
MINES, Park County, Co₂
Idle

KHIZLEY, E S

274 37th Road
Grand Junction
KARNS INCLINE MINE,
Beaver Mesa, U₃O₈, V₂O₅

KOSTELIC, LOUIS

LESSEE
283 W 3rd St, Leadville
BI-METALLIC MINE, undergr
Gen Mgr: Louis Kostelic

LA SALLE MNG CO

15-TON-GRAV-MILL
Mill Supt: Louis Kostelic
Assayr, W H Smith
Idle

LACY, JAMES

Hesperus
MINE, Au

LABRUM, THERMER R

Uranium
BLACKFOOT MINE, Montrose
County, U₃O₈

LA SALLE MNG CO

Box 217, Grand Junction
Part: M M Hardin, Roy M Eidel
G T Rummel, M F Rowe
CLUB MESA MINE, undergr
U₃O₈, V₂O₅, Uranium
Co-Mgrs: M F Rowe, G T

Rummel
Undergr prod
FAIRWAY MINE, Jamestown,
undergr, U₃O₈
Mine Supt: Jess Allen
Prods: 50 tons

LA SALLE MINE, Jamestown,

undergr, U₃O₈
Under devel

LAMBERG, GLENN & SONS

Box 106, Salida
SILVER ROCKER GROUP
Pegmatites
Idle

LAMBERTSON, JOHN

Box 567, Gunnison
STAR MINE GROUP, 56 mi N of
Gunnison, undergr, Pb, Ag

LAYTON BROS DRUM CO

PO Box 760, Grand Junction
MINE, U₃O₈

LEADVILLE LEAD CORP

410 Colorado Bldg, Denver
Pres: Robert G Risk
VP: Harvey Tedros
Supt: Byron White

Treas: Kenneth Miller
Gen Mgr: James Tiffany
HILLTOP MINES, Fairplay,
undergr, Pb, Zn, Ag, Cu
Under devel

LEE & SMALL MNG

PO Box 550, 431 Main St
Montrose
Stewart C Lee, U A Small,
125 S 3rd St W, American Fork,
Utah
Mine Mgr: Max Krey
MINES & CLAIMS, Montrose &
San Miguel Counties, undergr
U₃O₈
Under devel

LEWIS, F E & ARBOGAST, H L

Box 1481, Grand Junction
MINERAL CHANNEL NO 12,
RADIUM CYCLE, VALLEY VIEW
MINES, Ouray Mesa, U₃O₈,
V₂O₅

LIPPOTH & WEIN

DRILLING
300 North 9th St, Grand
Junction
MINE, U₃O₈

LITTLE JIMMY MNG & LEASING, INC

108 W Main St, Farmington,
Pres: M C Foster
VP: W B Boak
Sec & Treas: Avon Flanken
MINE, Telluride, Colo, undergr,
Au, Ag
Gen Mgr: James Dalpez
Under devel

LISON URANIUM CORP

3500 Hwy 50, Grand Junction
GATEWAY PROPERTIES,
Beaver Mesa, U₃O₈
Contractor: Charles V Woodyard
Prods: 750 tons per mo

LIVERMAN, GEORGE & CUNNINGHAM, C

2135 Orchard, Grand Junction
ELIZABETH NOS 3 & 17, Blue
Mesa, U₃O₈, V₂O₅

LODESTAR URANIUM, INC

Box 1550, Grand Junction
DEPRESSION NO 6, Flat Top,
U₃O₈, V₂O₅

LOMA CORP

316 Paramount Bldg
Denver 2
Pres: J E Spaulding
VP: R L Manning
Sec-Treas: J R Moran
Geol: D C Sargent
PROPERTIES,
Under devel
(See Wyo)

LONDON & JOHNSON

Box 275, Naturita
BLACK MAMMA, HANOVER
NO 4 & MODERN MINES,
San Miguel Co, U₃O₈
SUNBEAM MINE, Montrose Co,
U₃O₈

LESTER LOWERY

Ridgeway
MINE, U₃O₈

M & S INC

Salida
Pres: J W Magnuson
Gen Mgr: R H Magnuson
HOMESTAKE MINE, Surface
foldspar

MARCY-SHENANDOAH CORP

Jarvis Bldg, Durango
Pres & Gen Mgr: S S Tomlin
Jr
VP & Geol: E M Bargo
Sect: R M Schall
Treas: R R Goodgrass
GARRY OWN MINE, Silverton,
undergr, Pb, Zn, Au, Ag, Cu
Under devel
SILVER LAKE MINES, Silverton,
undergr, Pb, Zn, Au, Ag, Cu
Mine Supt: John Holmgren
Mech Engr: Roy Green
Under devel
CEDAR POINT MINE, Beaver
Mesa, undergr, U₃O₈, V₂O₅
Mine Supt: Glen Green
Asst Mine Supt: Fred Peaslee
Prods: 10 tons daily
700-TON FLOT MILL, Silverton
(See Ariz, Utah)

JERRY MAYFIELD

PO Box 231, Natoplia
MINE, U₃O₈

MAYFLOWER MNG & PETROLEUM CO

Box 331, Ouray
Pres: B J Easman
VP & Pres of Board: Z C Colt
Sect: A A Trussell
Treas: S G Colt, Jr
MOUNTAIN KING & CAMPBELL
EXTENSION MINES, Ouray, Pb,
Zn, Cu, Ag, Au, undergr,
Gen Mgr: Keith P Johnson
Geol: E W Reinhardt
Idle

McALESTER FUEL CO

PO Box 783, 208 E Wyanette
McAlester, Oklahoma
Pres: J G Peterbaugh
VP & Gen Mgr: Tom E Garrard
Sec-Treas: Carl Oman
Geol & Mine Engr: Robert Enoch
(PO Box 428, Riverton)
MECKEN MINE, open pit,
U₃O₈, V₂O₅
Gen Supt: Ralph Hawks

MERSE, WILLIAM

Box 93, Rifle
LUCKY BOY MINE, Colandry
Mesa, U₃O₈, V₂O₅

MESA MNG CO

4925 Montview Blvd, Denver
Pres-Gen Mgr: J W Walsh
VP: M W Walsh
Sec-Treas: Paul L Schmitt
MENA MINE, Golden, Jefferson
County, undergr, U₃O₈, Co,
Ag, Au
Mine-Supt: Lee H Babcock
Under devel

MICRO COPPER CORP

Marshall Ct, Moab, Utah
BADDOR, JOKER, LOG CABIN,
PRINCES, RED ROCK NO 8,
LOC CORRAL DRAW, LOC
STARLIGHT GRP & WILD CAT
MINES, Montrose Co, U₃O₈,
V₂O₅
QUARREL, PATTY, SUNRISE,
PICKETT CORRAL MINES,
Bull Canyon, Montrose Co,
U₃O₈, V₂O₅, undergr
RED ROCK, WILD CAT MINES,
Marion Mesa, Montrose Co,
undergr, U₃O₈, V₂O₅
Gen Supt: Donald Andrews,
Nuclea
(See Utah)

MID-CONTINENT URANIUM CORP

Uranium Center Bldg
Grand Junction
Pres: D L Williams
VP: Norman E Ebbly
Sec & Treas: M D Dunn
(Mines leased to Williams' Mng
Partnership & Daleco Uranium
Inc, Grand Junction, Colo)

MILE HIGH MINERALS INC

800 Petr. Club Bldg, Denver
(See Wyo)

MILLS & BRISCOE

PO Box 307, Walsenburg
MINE, U₃O₈

MINERALS PROD CO OF CALIF

1209 Bayshore Highway
Burlingame, Calif
Pres: George H Keyman Jr
VP: H H Van Aken
Sec-Treas: David H Keyman
MARY MURPHY MINE, Romley
undergr, Pb, Zn
Gen Mgr: H H Van Aken
Idle
(See Calif)

MINES DEVELOPMENT, INC

777 Grant St, Denver
Pres: Allen D Gray
Sec & Treas: N H Hoadley
Par Agt: P M Cheney
(See 3 Dsk)

MNG BUREAU OF ANALYSIS

3500 Thomas, Durango
Pres: G R Grandboush
BELL MINE, Fry Canyon
undergr, U₃O₈, Cu
Asst Gen Mgr: E Kahler
Geol: G R Grandboush
Geol: G R Grand
Prods: 25 tons daily
(See Utah)

MOLYBDENUM CORP OF AMERICA

Empire
URAD MINE & MILL, undergr
Mo, Molyb
Mgr: John B Carman
Idle
(See Calif, N Mex, NY, Pa.)

MONOGRAM MNG CO

PO Box 45, Rosend
PAT DAY MINES, Unswad,
undergr, U₃O₈, V₂O₅
Gen Mgr: A F Shaw
Contractors: C C F MNG &
Clifton Carter
Prods: 40 tons per day

MONOGRAM URANIUM & OIL CO

105 Petroleum Bldg
Grand Junction
Pres: Ray Baxter
VP: Howard F Carr
Sec-Treas: George E Ellis
GROUND HOG MINE, Naturita,
undergr, U₃O₈, V₂O₅
Mine Supt: Joseph N Turgeon
Prods: 18 tons
(See Utah)

MONTGOMERY, JACK

Gateway
BLACK MAMA MINE,
Tenderfoot Mesa, U₃O₈,
V₂O₅

CHICO FRACTION MINE, Mesa,

U₃O₈
K NOS MINE, U₃O₈
LAVADA MINE, U₃O₈

MULLINS, JA

Box 43, Lake City
BETH NOS 1-18, Hinsdale Co
U₃O₈

MUNROE, ERNEST W

Rt 2, Box 273, Fort Collins
GOODWIN QUARRY, Larimer
County, Gypsum

NATIONAL BERYL MNG CO

Box 1808, Estes Park
Pres: A L Vaughn
VP: Ed Schuber
Sect: J O Mail
Treas: Victor Walker
MINE, No Branch of Big
Thompson Rd, Larimer Co,
open pit, beryl, feldspar,
mica
Gen Supt: Herbert Jesser
Under devel

NATIONAL LEAD CO, INC

(Member Nuclear Metals Div
Nat'l Lead Co)
PO Box 1849, Grand Junction
Grand Junction Office
Tech Dir: D L E Crombie
AEC Research Contractor
Radioactive pollution studies
(See Ark, Calif., La, Mont, Mo,
Nev, Tenn, N Y, Tex, Wyo)

NATOMAS CO

Fairplay
DREDGE #1, Park County, Au
Ag
Local Supt: Webb Skinner
Idle
(See Calif)

NETERLAND MINES, INC

1821 Marine St, Boulder
Pres: Carl Rosen
VP & Sec: G A Horvath
CARIBOU MINE, Boulder, 8 mi
W of Nederland, undergr, Ag,
Pb, Au
Gen Mgr: Matthew Ollson
Idle
100-TON FLOT MILL, 6 mi E of
Nederland

NEESHAM MNG CO

Box 458, Nuclea
Gen Mgr: Glenn D Neesham
BUCKSKIN MINE, Bull Canyon,
undergr, U₃O₈, V₂O₅
PEGGIE, Sauer Basin, U₃O₈,
V₂O₅
Under devel
RUSTY MINE, undergr, U₃O₈,
V₂O₅

NEPTUNE URANIUM CORP

Denver 1
3625 Walnut St, PO Box 938
Pres: W E Griffith
VP & Gen Supt: L A Griffith
Sect: Ray Carson
Treas: Fred Burns
SHAMROCKS, KINGPINS &
OTHER MINES, undergr,
U₃O₈, V₂O₅
Geol: Paul H Keating
Prods: 2-3 tons
Under devel

NEW IDRIA MNG & CHEM CO

Idria, San Benito County
Calif
Pres: C Hyde Lewis
Sec-Treas: Arthur W Goring
URANIUM DIVISION, PO Box
311, Grand Junction, undergr,
U₃O₈, V₂O₅
Gen Mgr: Dean Nicholson
JOHNNIE MAE MINE, Beaver
Mesa, undergr, U₃O₈, V₂O₅
PACIFIC RAT, SHAKIN QUAKIN
HURBAN-HOMESTEAD
MINES, Beaver Mesa, undergr,
U₃O₈, V₂O₅
(Leased to Beaver Mesa
Uranium Inc)
(See Calif)

NEW JERSEY ZINC CO

EMPIRE ZINC DIV
Gilman
Supt, Gilman Oper: W L Jude
Plant Chief: Harold Steinmier
Personnel: Frank Steerwood
Accountant: Darrell C Barnes
EAGLE MINE, undergr, Pb, Zn
Mine Chief: A M Karwacki
1,200-TON FLOT MILL
MULCH: Foster J Wuthauer
(See Ill, N J, N Mex, N Y, Pa,
Tenn, Va, Wis)

NORBUTE CORP

408 Park Ave, New York 21
Pres: Nicolas M Balgo
WESTERN MNG DIV

PO BOX 1760, Grand Junction,

Colorado
VP: D C Deringer
Mgr: Abbott Charles
Geol: Kirby C Coryell
(See NY)

NORTH STANDARD MNG CO

Box 805, Provo, Utah
LARK-LEIGHTON GRP MINES,
Montrose Co, U₃O₈
(See Utah)

NORTHWESTERN CONSOLIDATE MNG CO

Box 45, Ft. Collins 2
(See Wyo)

NUCLEAR ENGINEERING CORP

c/o Quist Seeman & Quist
415 Symes Bldg, Denver 2
LONG'S GULCH PLACER,
Chaffee County, pegmatites
Under devel

NUCLEAR FUELS CORP

Oakland, Calif
MINE, U₃O₈

LEIGH D OHMAN

800 Bonnie Bras, Denver
MINE, U₃O₈

OLIVER BROTHERS

Newwood
MINE, U₃O₈

CLINTON OLIVER

Naturita
MINE, U₃O₈

OMNI-METALS INC

Box 500, Salida
Pres: W E Burleson
VP: John A Murphy
Sec: Harold R Kiefer
GARFIELD MINE, 20 mi W of
Salida, undergr, Pb, Au, Ag
Idle

ORR MINING COMPANY

Box 1036, Grand Junction
HENDERSON MINE, Outlaw
Mesa, U₃O₈, V₂O₅

ORTMAYER MNG CO

320 S 1st St, PO Box 1846
Grand Junction
Pres: C G Ortmayer
VP: Hilda Ortmayer
Sec: John Speight
LEGION LEASE, Egnar,
undergr, U₃O₈, V₂O₅
Gen Mgr: Frank Turman
Prods: 10 tons

OUTLET MNG CO

Box 38, Creede
Pres & Gen Mgr: James M
Muir, Jr

LARINO & PHOENIX LODGE

3 mi N of Creede, undergr,
Pb, Ag, Au
Supt: Isaac D Crawford
SMELTER, Leadville

OUTWEST URANIUM CO

833 Guaranty Bank Bldg
Denver
(See Nyo)

OZARK-MAHONING CO MNG DIV

310 W 6th, Tulsa, Okla &
Rosiclare, Ill
NORTHGATE MINE, undergr,
open pit, fluorspar, Cudwrey
6 mi
250-TON FLOT MILL, at
ENNETT & AFTERTHOUGHT
MINES, undergr, fluorspar
Contr: H B Williamsen
Idle
120-TON FLOT MILL, at
Jamestown
Idle
(See Ill, N Mex, Okla)

PACIFIC BASE METALS INC

PO Box 2280, Denver-1
Pres: P J McLaughlin
VP: Dr. C C Webb
Sec: R L McLaughlin
REX MINE, undergr,
Beryllium, Columblum,
Tantalum, Mica
Gen Mgr: R J McLaughlin
Gen Supt: H Trobaugh
Under devel

PACIFIC INDUSTRIES, INC (FLANDERS MNG CO - wholly owned, subd)

PO Box 881, Grand Junction

Pres: H L McIntyre
VP: E M Gage, Mark K Shipman
Sec-Treas: Ronald Bailey
Asst Sec: Thomas K Younger
H B Fraser, Paul T Wolf
GATEWAY MINES, Gateway
undergr, U₃O₈, V₂O₅
LA SAL ON MINE, Mesa Co,
U₃O₈
MAIDIE NO 2 MINE, Montrose
Co, U₃O₈
Mine From: W R Maupin
Prod: 30 tons per day
(See Calif)

PACIFIC URANIUM
MINES CO
1934 White St, Grand Junction
Pres: Dr M D Rasmussen
VP: H E Roberts, Bernard Elliott
Sec-Treas: Irving Klubok
Mgr: R L Redmond
(See N Mex)

PARK CITY CONS MINES
CO
39 Broadway, Rm 3067
New York 5
Pres & Treas: Carl Stehle
VP: J L Chadwick
Sec: George C Maw
KEYSTONE MINE, Crested
Butte, 20 mi S of Gunnison,
undergr, Fe, Pb, Cu, Ag
Gen Mgr: Nolan Probst
Geol: F T Stehle
230 TON FLOT MILL, Crested
Butte
(Operated by Amer Smelt &
Refin Co, See Utah)

SCHUYLER C PARKER
& JAMES WEIR
PO Box 187, Durango
PERJU MINE, Klamath Ridge,
San Miguel Co, undergr,
U₃O₈, V₂O₅
Idle

PASSIFLORA MNG CO
PO Box 749, Canon City
Pres: Charles A Billey
VP & Gen Supt: M N Taylor
Mrs: Meris N Shaw
Sec: J D Blunt
PASSIFLORA MINES, 1 1/2
mi N of Westcliffe, undergr,
Ag, Pb, Cu, Au, U₃O₈
Idle

JAMES PATTERSON
Uranium
MINES, U₃O₈

PRESTON PERKINS
Naturita
MINES, U₃O₈

PEROSLITE PRODUCTS
INC
Box 1054, Denver
MINE, Custer County, Pariaite

PETERSON, FREDDIE M
PO Box 581, Uranium
JEEP MINE, Montrose
Co, U₃O₈

PETERSON, RICHARD L
& ANDERSON, BRUCE
Box 5, Douglas, #70
GRACE-GREENWOOD MINE,
Cripple Cr, Au, undergr
Geol: Warren Ove
Mine From: Louis Pfeiffer
Prod: 13 tons per day
Under devel
(See Western Eng Corp, #70)

PINNACLE
EXPLORATION, INC
Gunnison
AKRON MINE, White Pine
Ida
INDIAN CREEK PROSPECT,
Gunnison, undergr, U₃O₈
Gen Mgr: J E Dunn
Gen Supt: R J Flynn
Geol: H C Scott
Mng Engr: D McCrindle
PITCH MINE, Gunnison, 10
mi SE of Sargents, undergr
U₃O₈
Mine From: Shildon Houle
Prod: 40 tons

PIONEER EXPL CO
Box 864, Craig
BUTLER LEACH MINE,
Moffat Co, U₃O₈
Idle

PITTSBURG-NOTAWAY
MINES
Box 87, Central City
PITTSBURG-NOTAWAY MINE
undergr,
Gen Mgr: Ernest A Davis
Gen Supt: Robert E Brooks
Geol: Robert T Forest
Mine Supt: Robert E Brooks
Ida

C E & DWIGHT POLAND
Box 357, Grand Junction
HOPE MINE, Mesa Co, U₃O₈

POLAND CONSTRUCTION
CO
134 S 7th St, Grand Junction
HOPE GROUP MINE, Blue
Mesa, U₃O₈, V₂O₅

PONCHO OIL & MNG
INC
36 W Broadway, Salt Lake
City, Utah
CIVET CAT CLAIMS, San
Miguel Co, U₃O₈
(Leased out)

PETTY BLUE MINING
CO
PO Box 87, Placerville
MINE, U₃O₈

PRIDE OF THE WEST,
INC
Box 412, Silverton
Agent: C Leslie Larson
PRIDE OF THE WEST MINE,
San Juan County, Zn, Pb,
Ag, Au
Under devel

QUEEN MARIE MINING
CO
Crested
MINE, U₃O₈

W B QUINN
6223 West Park, St Louis,
Missouri
MINE, U₃O₈

RAMPART MNG CO
Box 1774, Colorado Springs
IRON MTN CLM, Fremont
County, Mo
COTTONWOOD NO 1, Fremont
County, Mo
RAMPART NO 1, El Paso
County, Mo
Under devel

RAY, ROBERT R
4440 Jason St, Denver 8
SUBURBAN SAND & GRAVEL
PIT, Jefferson County, Au, Ag

RECO MINING CO
Naturita
MINE, U₃O₈

REID & REID
Naturita
MINE, U₃O₈

REX URANIUM CORP
Box 1338, Farmington, N Mex
DUCHESNE MINE, Uranium,
undergr, U₃O₈, V₂O₅
Gen Mgr: R J Scanlon
Lessee: A E David
Under devel

AKAK MINE, Uranium,
undergr, U₃O₈, V₂O₅
Gen Mgr: R J Scanlon
Mine Supt: Stan Reed
Prod: 30 tons per day
Under devel
(See N Mex)

RICE DEVELOPMENT
CO
Pratts
MINE, U₃O₈

FRED RICHARDS & SON
Box 87, Nucle
MINERAL JOE NO 1 INCLINE
MINE, U₃O₈

RICKS, JOHN
282 1/2 Road, Grand Junction
CALAMITY NO 1, Calamity
Mesa, U₃O₈, V₂O₅

RIO BLANCO CORP
1010 Arcade Bldg, St Louis
Missouri
MINE, U₃O₈

RICO ARGENTINE MNG
CO
217 Kearns Bldg, Salt Lake
City, Utah
Pres: Sherman B Hinchley
VP: J C Johnson

Sec: L J Lerwill
Treas: S B Hall
Parth Agt: Sherman B Hinchley
MT SPRINGS & ARGENTINE
MINES, Rico, undergr, open
pit, pyrite, Pb, Zn, Ag
Gen Mgr: Sherman B Hinchley
Assayer: H Toller
150-TON FLOT MILL, at mine
Assayer: H Toller
150-TON SULFURIC ACID
PLANT, at mine
(See Utah)

JOHN B RIGG
1500 E 7th Ave, Denver
SUMMITVILLE MINE, Rio
Grande Co, undergr, Au, Ag, Cu
Prod: 50 tons daily
CYANIDE MILL, Summitville
Prod: 150 tons daily

RINDERLE, A C
404 Sherman Dr., Grand
Junction
ARROWHEAD NO 23, Calamity
Mesa, U₃O₈, V₂O₅
ARROWHEAD INCLINE NO 13,
U₃O₈, V₂O₅

ROBINSON, BOYD
1854 Canon Ave
Grand Junction
IRON LODGE NO 2, San Miguel
County, Fe

ROBINSON RANCH MINES
Livermore
Own: Elbert C Robinson
RED HILL NO 1, LADY MOON
MINES, undergr, open pit,
U₃O₈, Fe, pyrite
Under devel

ROBUSH, JOHN & EARL
Box 288, Cripple Creek
HENRY EDNEY SHAFT, Teller
Co, Au

ALVA A ROCKWELL
Dove Creek
MINE, U₃O₈

ROCKY MTN MILL &
CHEM CO
1641 4th St, Boulder
WIENE & LANAM MINES,
Custer Co, S Dak, U₃O₈
(See S Dak)

ROOT RANCH
Idaho Springs
MINE, U₃O₈

HOMER ROSENQUIST
Nucle
MINE, U₃O₈

ROSS L E
Placerville
MINE, U₃O₈

ROUVILLE MNG CO
Silverton
Pres: Eugene S Hoffman
ROUVILLE MINE, Red Mt mng
dist, Cury County, undergr,
Pb, Cu, Ag
Gen Mgr: Ernest S Hoffman
Under devel

SABRE-PINON CORP
Bokum Bldg, Santa Fe, N Mex
Pres: R D Bolam, II
VP: George Slover, Jr
Treas: Hugh M Craigie
STEER #2 MINE, Bull Canyon
dist, Montrose County
(See N Mex)

SACRAMENTO GULCH
MNG CO
978 Miller St, Lakewood 15
Pres: Arthur A Cervi
VP: Silvio Cervi
Sec: May Cervi
SACRAMENTO MINE, Park
County, undergr, Ag, Au, U₃O₈
Mine Supt: Cervi
Under devel

ST ANTHONY URANIUM
CORP
PO Box 1789, Grand Junction
Pres: Frank Coulbough
VP & Gen Mgr: A M Mastrovich
Sec: John P Fitz-Gibbon
Treas: J D Carnahan
URANIUM EXPLORATION,
N Mex
(See N Mex & Kennecott Copper
Corp, NY)

ST JUDE MNG CORP
PO Box 1005, Pueblo
Pres: L G Dalls
VP: E B Loy
Sec-Treas: Jack C Costanza
SWEET HOME MINE, Alma
(Leased from Edwin C Spray)
SAMMY BOY MINE, Bonanza,
Ag, Pb, Cu, Au, Zn, undergr
Gen Supt: Warren Good
Mine Supt & Geol: Gordon V Klassen
Under devel

ST PAUL MINERALS
Gold Hill St, Route, Sunshine
Pres: L W Tyrer
Sec & Treas: H C Tyrer
MINE, Gold Hill Mining Dist,
undergr
Under devel

ST REGIS URANIUM
CORP
2285 S Jackson St, Denver
Pres: E B Brannan
VP: Thomas Kasalis
Treas: Neil Horan
Sec: T K Brannan
LOVE PINE MINE, Montrose
County, undergr, U₃O₈,
V₂O₅
Gen Mgr: E B Brannan
Mine Supt: Delbert Dyer, Lessee
Under devel

H A SARGENT
Moab, Utah
MINE, U₃O₈

SEACOL INC
810 Greenwood, Canon City
MINE, U₃O₈

SHATTUCK DENN MNG
CO
317 Main St, Grand Junction
Gen Mgr: Thomas W Garrett
Gen Supt: Frank W Garrett
Geol: Carl S Appella
Purch Agt: Jack D Hill
TOM BARDON MINE, undergr
U₃O₈ Big Indian Dist

SHELLHAAS & WERNET,
LESSEE
Nederland
ILLINOIS DUMP & MADELINE
GULCH MINES, Boulder
County, surface, WO₃

SHIPROCK INDUSTRIES
INC
2006 Nat'l Bank of Tulsa
Tulsa, Okla
Pres: Lee A Hunsy
VP: Rowland D Young & Nels W Stalheim

Sec: L G Jump
MINE, Box 461, Boulder,
undergr, WO₃
Mine Supt: George Jump
Idle
(See N Mex)

SHIPROCK LTD
308 Continental Bldg
Dallas, Texas
MINE, U₃O₈

SILVER BELL MINES CO
833 Guaranty Bank Bldg
Denver 3
Pres & Gen Mgr: E H Sanders
VP: E J Ward
Sec: J W Metzger
SILVER BELL & CARRONERO
MINE, Ophir, undergr, Au, Pb
Ag, Cu
Gen Supt: Lesley E Smith
Idle

SILVER BULL MNG
771 S Santa Fe, Pueblo
BIG FOUR, Summit County, Au
Ida

SIMPSON MNG CO
304 Mesa Ave, Grand
Junction
GRASS FLAT MINE, San
Miguel Co, U₃O₈

SITTON & SITTON
Dove Creek
MINE, U₃O₈

SKIDMORE MNG CO
Box 588, Delores
Pres: T H Skidmore

VP: G H Skidmore
LEGION GROUP, undergr, U₃O₈
V₂O₅
Asst Gen Mgr: A L Skidmore
PABROT GROUP, undergr
U₃O₈, V₂O₅
Gen Supt: Chess Almond
E J SMALLER MINING
PO Box 168, Canon City
MINE, U₃O₈

SMITH & THOMPSON
Naturita
MINE, U₃O₈

CLINTON W SNYDER
PO Box 324, Paradox
MINE, U₃O₈

SOUTHERN & CALAHAN
5106 San Mateo Rd
Grants, N Mex
PARROT MINE, San Miguel Co,
U₃O₈
(See N Mex)

DALE SOUTHERS
Naturita
MINE, U₃O₈

SPRAY, EDWIN C
1337 Washington St, Denver
SWEET HOME MINE, Alma
(Leased to St Jude Mining Corp)

STANDARD URANIUM
CORP
Silverton
Pres: W B McCormack
Mgr: Ming Opera: R Wood
AMERICAN TUNNEL
Gen Supt: Robert Hurst
Chief Engr: R H Ward
Office Mgr: E A Larson
SHENANDOAH DIVES MINE
Supt: J Holmgren
750 TON FLOT MILL
MICAWHER MINE, undergr, Pb
Zn, Au
Mine Supt: Jack H Dressel
Ch Engr: Robert R Ward
(See Ariz, Utah)

STERRY BROTHERS
Route 5, Grand Junction
ARROWHEAD NOS 23 & 24,
Arrowhead Mesa, U₃O₈, V₂O₅

STRATTON CRIPPLE
CREEK MNG & DEVEL CO
Box 178, Colorado Springs
Pres: A G Hill
Sec-Treas: Kenneth Brown
VP-Supt: James H Keener
MINES, under lease

SUNRAY MNG CO
2708 Highway 50 So
Grand Junction
CORVUSITE & PEGGY 1 & 2
MINES, Mesa and Montrose
Counties, U₃O₈
(See Utah)

SUPERIOR MINES CORP
Box 127, Salido
RAWLEY MINE, Saguache Co,
Pb, Zn

SUSQUEHANNA-
WESTERN, INC
777 Grant St, Denver 3
Pres: Allen D Gray
VP-Sec-Treas:
Wm H Headley
Mgr, Mng Dir: G T Bator
Purch Agt: P M Cheney
Met Consultant: H L Hassen
(See Wyo)

SUTTON, C A
487 Insurance Bldg.,
Wichita, Kansas
B & B, AND BARON MINE,
Summit Co, Au

TALL TIMBER MNG CO
c/o L R Haman, 908 Grant St,
Denver
MINE, near Indian Hills, open
pit, feldspar, Ba, Mica
Idle

TALLAHASSEE URANIUM
CORP
Box 168, Canyon City
U₃O₈

THE TENDERFOOT MNG
CO
818 17th St, Denver 3
Pres: A L Metaner, Jr
Sec & Treas: K R Whiting
MINE, Cripple Creek, undergr,
Au
(Leased out)

TEXAS-ZINC MINERALS

KORP
(Subsidiary of New Jersey Zinc Co.)
1129 Colorado Ave.
Grand Junction
Pres: N K Banks
(See Utah)

ART THOMPSON

Urevaan
MINE, U₃O₈

T E THOMPSON & STANLEY R JOHNSON

PO Box 197, Dove Creek
MINE, U₃O₈

THORNBURG MNG CO

140 W Main, Grand Junction
(See Utah)

TRACE ELEMENTS

CORP
(UNIT OF UNION CARBIDE NUCLEAR CO.)
Mayfield

MAYBELL MINE & MILL

Maybell, surface, U₃O₈
Gen Mgr: J L Lake
Mgr Mines: J F Emerson
Mgr, Adm: J F Brenton
Mgr, Plants: A C Sada
Mine Supt: A W Woods
Mine Frnt: K Lamberton
Mill Frnt: J E Massey
Mill Supt: D M Pembbridge

TRANS MTN URAN CO & GLOBE HILL

217 Independence Bldg.
Colorado Springs
MINE, U₃O₈
Under devel

TREASURE MOUNTAIN GOLD MNG CO

202 Midland Savings Bldg.
Denver 2
Pres: Guy L V Emerson
Sec: A W Fischer
SANDIAGO, SAN JUAN, QUEEN
GOLDEN FLEECE & SCOTIA
MINES, 11 mi NW of Silverton,
undergr, Au, Ag, Pb, Zn, Mn
etc

W D TRIPP MINING CO

Box 291, Dove Creek,
CANFIELD MINES, Egnar,
Colo, undergr, U₃O₈, V₂O₅
Gen Mgr: W D Tripp
Asst. Gen Mgr: D Knuckles
Mine Supt: W D Tripp
Asst Mine Supt: D Knuckles
Prod: 15 tons daily
Under devel

TUNGSTEN MNG CO, INC

420 Pine St, Boulder
Pres & Treas: George W
Cowdery
VP & Sec: William D Cowdery
TUNGSTEN MINE, Boulder
undergr, WO₃

ACE TURNER URANIUM CORP

C H Jacobson
PO Box 1001, Grand Junction
MINE, U₃O₈

TWIN STAR MINING CO

c/o Louis Smith, Meeker
MINE, U₃O₈

TYLER, L W

Gold Hill Star Rt, Boulder
GRANDVIEW MINE, Boulder
County, WO₃
etc

UNION CARBIDE NUCLEAR COMPANY

(DIV OF UNION CARBIDE CORP)
1800 U Avenue, Grand
Junction

Gen Mgr-Colo Plateaus: J L Lake
Mgr Of Plants: A C Sada
Asst Mgr, Plants:

H H Jackson
Mgr Mines: J F Emerson
Asst Mgr Mines: J R van Fleet
Mgr, Adm: J F Brenton
Mgr, Explor: T S Ary
Asst Mgr, Explor: W H
Kochler

Mgr, Pub Rel: L E
McCarthy
Ch Eng, Research & Devel:
J A Tavelli

Mgr of Engrg: R C Olson
Mgr of Acct & Finance:
C F Martin

Ch Geol: J E Mathis
Ch Met: D C Seidel
MINE & MILL, Urevaan,
undergr, U₃O₈, V₂O₅

Plant Supt: A W Lankensau
Mine Supt: J R Borden
Mill Supt: D G Millenbruch
MINE & MILL, Black Rock,
undergr, U₃O₈, V₂O₅
Mill Supt: O J Malacarne
Mine Supt: W W Witt
CHEMICAL MILL, Rifle
Plant Supt: F T Temple
Asst Plant Supt: J M Chandler
(See Calif, Nev, NY, Utah, Wyo)

UNITED GOLD MINES CO

Box 127, Cripple Creek
Pres: M E Shoup
VP & Gen Mgr: Max W Bowen
Gen Supt: C H Carlton
VINDICATOR & PORTLAND
MINES, Victor, undergr, Au, Ag
etc

U S BERYLLIUM CORP

306 Bon Durant Bldg, Pueblo
BOOMER LORE MINE, Park
Co, Beryl
(Lessee from Min Dale Mng
Co)

U S GYPSUM CO

306 W Adams St
Chicago 8, Ill
QUARRY, Loveland, gypsum,
open pit
Works Mgr: J R Miner
Under devel

(See Calif, Conn, Ill, Ind, Iowa,
Mass, Okla, S D, Tex, Utah,
Va)

U S LITHIUM CORP

1205 Walker Bank Bldg,
Salt Lake City, Utah
BROWN DERBY & TUCKER
MINES, Gunnison County,
undergr, lepidolite, spodumene
Gen Mgr: Paul T Walton
(See Utah)

UNITED URANIUM CORP

408 Empire Bldg,
430 16th St, Denver 2
Pres: Ray Fahlander
VP: Edgar Payton
Sec-Treas: R H Foster
HOT DRILL #1 PICO #1 MINES,
undergr, Dove Creek, U₃O₈,
V₂O₅
Ida

URADOX MNG CO

Box 214, Montrose
RATTLESNAKE CLM MINE,
Montrose Co, U₃O₈

URANIUM ENTERPRISES INC

2670 Arapahoe St, Boulder
MINE, U₃O₈

URANIUM EXPLORERS SYNDICATE

545 Emerson St, Denver
Gen Mgr: J R Bromfield
URANINITE, CORVUITE
claims in Mesa and San Miguel
counties
Under devel

URANIUM INDUSTRIES, INC

523 Colorado Bldg, Denver
(See Utah)

URANIUM PRODUCERS, INC

1536 Welton St, Denver 2
Mgr: Harry E Coppin
URANIUM MINE, Slick Rock
dist, Montrose County
Under devel

UTE URANIUM INC

1424 N Hancock Suite W3
Colorado Springs
MINE, U₃O₈

VALLEY MNG CO

Box 248, Moab, Utah
BLACK STREAK, Blue Mesa,
U₃O₈, V₂O₅
BLACK JUMBO GROUP, Mesa,
DEER RUN MINE, U₃O₈

VANADIUM CORP OF AMERICA

PO Box 761, Durango
Pres: W C Keeley
Sec: D A Shriver
Treas: L C Miller
VP-Gen Mgr: D W Viles
BURANGO PERSONNEL
Gen Mgr: Fred A Brinker
Mgr, Land Explor & Ore
Buying: P L Edwards
Mines Supt: Robert L Anderson
MINES, Colorado Plateau,
undergr, open pit, V₂O₅,
U₃O₈
Mine Engr: Win W Whitmeyer
Mines Auditor: D Ornela
Safety Engr: R G Venner
Mgr, Safety & Pers:
L A Maxwell
Ch Geol: E E Waulters
Geol: Jack L Benham
Prod: 400-600 tons
600-TON MILL, Durango
Plant Supt: L A Daniels
Asst Supt: Bob Newland
Master Mech: C Dale Prior
Ch Chem: Wayne Lowry
(See Ariz, N Mex, N Y)

VANADIUM QUEEN URANIUM CORP

PO Box 1874, Grand Junction
Pres: Don Danvers
Sec-Treas: Dick Harrison
VANADIUM QUEEN MINE,
La Sal Creek, undergr, U₃O₈,
V₂O₅
Res Engr: John I Schumacher
Prod: 25 tons
(Oper under contract to Joe
Pitts, 133 W Mesa, Grand
Junction)

VILLA GROVE TURQUOISE MINE

Villa Grove
LODE, Seguche County,
Turquoise

VOGEL MINE & EXPLOR CO

Box 3183, Amarillo, Texas
Purch Agt: Harold W Vogel
BLUE BONNET NO 5 MINE,
Lake City, undergr, Au, Ag, Zn
Boxite, U₃O₈
Gen Mgr & Mine Supt:
Harold W Vogel
Asst Gen Mgr: Harold M Ham
Under devel
(See N Mex)

W A H CHANG CORP

Box 441, Boulder
50-TON GRAV MILL, Sugar
Loaf Road, Boulder
Rep in Charge: Earl G Sweeney
10-TON FLOT GRAV MILL
Sugar Loaf Rd, Boulder
/ Ill

WARD & FEELEY

Lake George
MINE, U₃O₈

WATTERS, MARION R

Rte 1, Dolores
MINING LEASE NO 30 MINE,
San Miguel Co, U₃O₈

WELLMAN, NORMAN

Box 1801, Grand Junction
ARROWHEAD NO 21, Calamity
Mesa, U₃O₈, V₂O₅
ARROWHEAD INCLINE NO 5
U₃O₈, V₂O₅
BLUE RIDGE INCLINE NO 3
U₃O₈, V₂O₅
YELLOW JACKET NO 18,
U₃O₈, V₂O₅

WESTERN FELDSPAR MFG CO

Box 671, Salida
Sec-Treas: J W Magnuson
PLANT, near Salida, feldspar
Under devel

WESTERN GOLD & URANIUM INC

Box 95, Grand Canyon, Ariz
RITO SECO MINE, San Luis, Au
etc
(See Ariz, Utah)

WESTERN MINERALS DEV CO INC

Utah Corp
Vernal, Utah
SUZIE Q GROUP-JENSEN PAT-
MOFFAT MINE, U₃O₈

WHITE CANYON MNG CO

1125 Colorado Ave
Grand Junction
Pres: F J Malott
VP: John H Morgan, Sr
Sec: Warren F Reams
Treas: E E Schweigler
Purch Agt: Troy E Wade
Gen Mgr: A F Boyd
(See Utah)

WILD & FRANDSON

110 W 10 St, Loveland
HIDE AWAY LORE MINE,
Masonville, Beryl

WILLIAMS, GLEN D

818 S Pierce Dr, Gallup
N Mex
WILLIAMS MINE, Fremont Co,
U₃O₈
SCHOOL SEC. 36 MINE, U₃O₈

WILLIAMS MNG CO

PO Box 22, Canon City
Own: Glenn D Williams
MINE, Fremont Co, undergr,
U₃O₈
Gen Mgr: A G Williams

WILLIAMS' MNG PARTNERSHIP

Urutium Center Bldg.
Grand Junction
Mgr Part: R E Williams
Office Mgr: J E Danielson
(Leased from Mid-Continental
Urutium Corp; See N Mex)

TONY WILLIAMS CO

PO Box 683, Aspen
MINE, U₃O₈

WILLIAMSON MNG CO

Box 431, Boulder
Pres & Gen Mgr: Harry B
Williams

VP: M W Colby

Sec: H W Loozer
EMMETT-ARGO MINES,
Jamestown, undergr, open
pit, CaF₂, Au
Mine Supt: B D Lott
Mech Eng: A C Walker
Prod: 150 tons

WILLOUGHBY MINING CO

Grand Junction
MINE, U₃O₈

WOLNEY, BOB

Nucia
SEMO MINE, Montrose Co,
U₃O₈

WOODARD, CHARLES V & CO

2909 U S Hwy 50
Grand Junction
ZEE LEASE MINE, Gateway,
U₃O₈, V₂O₅, undergr
Gen Mgr: Charles V Woodard
Gen Supt: Frank E Woodard
Prod: 30 tons

WORCESTER MINES

2512 Mira Vista Rd,
Grand Junction
Mng Part: John W Hill
WORCESTER MINE, Urevaan,
undergr, U₃O₈, V₂O₅
Frnt: Paul R Martin
Shift Boss: James Dues

ZANETT MNG CO

Curay
BIG SEVEN, ELIZABETH NO
16, Belmont No 1-2-3, Mesa
Co, U₃O₈
JOHN E MINE, Montrose Co,
U₃O₈

ZIMMERMAN, BEN

2940 1/2 F Road
Grand Junction
BELMONT NO 1-2-3 MINE,
Mesa Co, U₃O₈

ZINGHEIM, MRS E E

1427 River St, Canon City
DEVILS HOLE MINE, Fremont
County, pegmatites
Under devel

CONNECTICUT

FELDSPAR CORP, THE

PO Box 49, Middletown
Pres: N Cleveland
VP: F S Miller
C Rogers, Jr
Sec-Treas: G N Blevins
(See Ga, N C, Tenn)

HISE, HOMER

Georgetown
MINE, open pit, Mica & Beryl

NUTMEG MNG CORP

Borden Bldg, Lakeville
Pres: Arthur F Levine
VP: Charles Citielli
Sec-Treas: Frank R Nuttall
MT PROSPECT, OLD POOL
MINES, Rantam, undergr, Ni
Cu
Under devel & Explor

U S GYPSUM CO

300 N Adams St
Chicago 6, Ill
FALLS VILLAGE MINE, Falls
Village, open pit, limestone
Works Mgr: C P Sweenia
(See Calif, Colo, Ill, Ind, Iowa,
Mass, Okla, S D, Tex, Utah,
Va)

WORTH SPAR CO

Pres: James Stevens Jr
Cobalt
MINE, open pit, Feldspar

DELAWARE

E I DU PONT & CO

Pigments Dept, 1007 Market
St, Wilmington
(See Fla)

FLORIDA

AMER AGRI CHEM CO, THE

100 Church St, New York 7, NY
PHOSPHATE ROCK MINES,
Pierce, Polk County, open pit,
phosphate, rock
Gen Mgr: F R Bergquist
Gen Supt: J S Ornel
Geol: R D Evans
Mech Engr: H R Quins
Met: R R Evans
H W Hecatt
Elec Engr: C R Rowand
Mine Supt: N M Faulds
Asst Mine Supt: H C Cravey &
F W Cook
Mine Engr: T J Anderson, Jr
(See N Y)

AMERICAN CYANAMID CO

30 Rockefeller Plaza,
New York 20, N Y
Pres: W G Malcolm
Exec VP: K H Kilpatrick &
G R Martin
Sec: R S Kyle
Treas: G C Walker
Purch Agt: H K LaRoue
Mgr of Phosphate Oper:
Arthur Crago

ORANGE PARK & SYDNEY MINES

Brewster, open pit,
phosphate
Gen Mgr: E M Haynesworth
Asst Gen Mgr: S C Watkins
Gen Supt, Sydney: C B Duke
Gen Supt, Orange Park:
F A Vogler
Geol: G L Hunt
Mech Engr: R L Taber
Met: F R Thornton
Mine Engr: E K Cuatred
Elec Engr: C A Dees
Prod: 24,000 cu yds matrix
(both mines)
6800-TON FLOT MILL, Brewster
(both mines)
(See Ark, Ga, Va, N Y)

ARMOUR FERTILIZER WORKS INC

Box 1885, Atlanta, Ga
MINE, Bartow, phosphate, open
pit
FLOT MILL, Bartow
(See Tenn)

CONTINENTAL MINERAL PROCESSING CORP

1st Nat'l Bank Bldg
Cincinnati 2, Ohio
Pres & Gen Mgr:
Frederick A Hawk
MINE, Brevard County, open
pit, rutile, ilmenite, zircon
Prod: 70 tons
(See Ohio)

E I DU PONT de NEMOURS & CO

Pigments Dept, 1007 Market
St, Wilmington, Del
HIGHLAND PLANT, (office)
Drawer A, Lewist, &
TRAIL RIDGE PLANT, (office)
Drawer 783, Starke
HIGHLAND PLANT, 1 mi

E of Lawley, open pit, Ilmenite, Zircon, Staurolite
Gen Mgr: Charles R Hager
Prod Supt: A D Vincent
Maint Eng: Frank Hagen
Plant Tech: J L Wetherington
Mine Supt: W C Coran
Prod: 20,000 tons

TRAIL RIDGE PLANT, 6 mi E of Starke, (Camp Blinding) open pit, Ilmenite, Zircon, Staurolite
Gen Mgr: Charles R Hager
Prod Supt: E M Conner
Maint Eng: F W Harris, Jr
Plant Tech: J F Mulling
Mine Supt: V A Nichols
Prod: 20,000 tons
30,000-TON GRAV MILL, Electrostatic
Mill Supt, Highland: E V Widgren
Mill Supt, Trail Ridge: H A Nelson, J L Chitty

(See Tel)

EDGAR PLASTIC KAOLIN CO

Edgar
Pres: A C Edgar
VP, Sales: A C Edgar
VP, Prod: G E Davis, Jr
Treas: Prod Supt: G J Lane
MINE, open pit

THE FLORIDA MINERALS CO DIV OF HOBART BROS CO

Box 1597, Vero Beach
Pres & Gen Mgr: N A Van Ausdal

VP: Wm Hobart, Jr
Sect: Lowell Isenbarger
Treas: B A Lutz
Purch Agt & Gen Supt: Sterling Dangler
MINE, Winter Beach, open pit, rutile, zircon, ilmenite
MILL, at mine
Prod: 15,000 tons per yr
(See Chas)

FLORIDIN CO

(Owned by Pennsylvania Glass and Corp)

Tallahassee
Chmn: A C Jackson
Pres: D H Howell
VP: Wm J Woods Jr, J W Moore
VP: Wm J Woods Jr, L C O'Brien
VP, Maint: C L Howell
Sec-Treas: C G Koebley
QUINCY PLANT, Box 510, Quincy, surface, fuller's earth
Plant Mgr: A D Sapp
JAMESON PLANT, Jameson
Idle

CHESEBROUGH, MARVIN OWENS, FRANK SMITH II, D OWENS MINES

HUMPHREYS MNG CO
PO Box 5452, Jacksonville 7
Pres: A E Humphreys
VP: J P Wood, Frank McKinley
VP-Gen Mgr: E C Weichel
JACKSONVILLE PLANT, 6 mi E of Jacksonville, placer, ilmenite, rutile, zircon, monazite
Plant Supt: Homer Lewis
Prod Supt: A D Whaler
Plant Eng: J H Ellledge
Purch Agt: S L Jackson
Mine Eng: R M Lewis
Mill Supt: L A Gray
Mine Supt: V D Mathews
Maint Supt: C J Bastedo
(See Colo)

KELLOGG CO
920 Franklin St, Ocala
PHOSPHATE MINE

KIBLER-CAMP
PHOSPHATE ENTERPRISE

Box 808, Ocala
Treas: Taylor Scott
Purch Agt: T D Felten
REC 10 MINE, Dunnellon, open pit, hard rock phosphate
Gen Mgr: D B Kibler, Jr
Asst Gen Mgr: Clarence Camp II
Gen Supt: T D Felten
Mine Supt: N T Farrell
Prod: 300 tons

LONCALA PHOSPHATE CO

Box 330, High Springs
Pres & Gen Mgr: Sam Kelly
VP: Chas A Savage
MONA MINE 3 mi W Newberry, soft phosphate with colloidal clay
Supt: H L Parker
FT WHITE MINE, Lake City Junction
PLANTS, at mine

MAGNET COVE BARIUM CORP

Box 6304, Houston, Texas
MINE, Hinson, open pit
Fuller's Earth
MILL, 300 tons dry grind
Div Mgr: C L Wilkinson, Jr
Plant Mgr: H C White
Prod Mgr: C F Talbot
(See Ark, Mo, Nev, Texas, Wyo)

SMITH-DOUGLASS CO, INC

Box 750, Plant City
VP: R S Rydell
Sect: W R Messer
Purch Agt: R R Hicks
TENOROC MINE, 7 mi NE Lakeland, Polk County, near Auburndale, open pit, phosphate rock
Gen Mgr: R M Wilbur
Gen Supt: H H Taylor
Dir, Research: C A Hollingsworth
Chf Eng: E G Padgett
Ch Chem: D B Underhill
Mine Supt: L G Wood
Mine Eng: E A Sawtiske
FLOT MILL, 4 mi SE Plant City, washing & screening
Mill Supt: C E Mills
(See Va)

SUPERIOR PHOSPHATE CO

Box 476, Dunnellon
Pres: Bonate E Bond
VP: R D Bond
Sect: W R Smith
BAR MINE, Citrus Co, phosphate clay
Supt: J H Roof
DUNNELLON MINE, 1 1/2 mi N Dunnellon in Marion Co, phosphatic clay
Supt: R D Roof

SWIFT & CO

PO Box 208, Bartow
WATSON & VARN MINES, near Fort Meade, open pit, phosphate
Gen Mgr: H P Gould
Gen Supt: O D Bowers
Mech Eng: W B Hunt
Elec Eng: H K Young
Sect: J B Grant
Asst Mine Supt: E E McKinney
C W Justice
Prod: 5500 tons

AGRICOLA FLOT PLANT (See Ill)

UNITED CLAY MINES CORP

Bawthorne
MINE NO 4, open pit, kaolin, glass sand
Mine Supt: L F Worley
Mine Eng: R J Caine
MILL, at mine
(See Ga, Md, N J, S C, Tenn)

VIRGINIA-CAROLINA CEMENT CORP

FLORIDA MNG DEPT

Nichols
Mgr: H L Pascoe
Asst Mgr: C V O Hughes
Opr Mgr, Mag Div: A A Farrell
HOMELAND MINE, 2 mi E Homeland, phosphate
Supt: E E Broer
PHOSMICO MINE, 3 mi E Barton, phosphate
Supt: W R Cullup
CLEAR SPRINGS MINE, 3 mi SE of Barton
1800S-TON FLOT MILL
(See Tenn, Va)

W R GRACE & CO DAVIDSON CHEMICAL DIV

Florida Phosphate Opr
Box 471, Bartow
Gen Mgr: W R Fort
Asst Mgr: J D Clary
Mgr, Prod Plant: J L Hunter, Jr
Purch Agt: W W Thornton
Ch Chem: C D McDowell
Ch Eng: A J Frost
Asst Ch Eng: B W Johnson
Elec Eng: J C O'Neal
Gen Supt: B P Jones
Project Eng: C H Greene
Field Eng: T L Nelson
Mines Plant: M F McArthur
Safe Supt: J D Phillips
Gen Mines Supt: B P Jones
Phosphate Rock Maint Supt: E J Purcell
Triple Plant Supt: O L Brooks

Triple Plant Maint Supt: D W Flagler
Proj Eng: C G Olson
Process Eng: Triple: C F Peters
Process Eng, Phos Rock: C G Olson

BONNY LAKE MINE, Bartow surface, phosphate
Supt: W A Allen
PAUWAY #4 MINE, 4 mi W of Eaton Park
Supt: F H Elliott
BARTOW DRY MILL, Ridgewood
Supt: L L White
(See Md)

GEORGIA

ALBEE-YORK MNG CO, INC

Box 356, Cedartown
Pres & Gen Mgr: S B Albee, Jr
VP: Glenn T York, Sr
Sect: Glenn T York, Jr
Asst Gen Mgr: S B Albee, Jr
Purch Agt: S B Albee, Jr & S B Albee, Jr
OREMONT MINE, open pit, Fe
Gen Supt: Joe Allen Baker, Jr
Mine Eng: S B Albee, Jr
Prod: 250 tons
CANTON MINE, Canton
900-TON HEAVY MED MILL, Oremont

AMERICAN CYANAMID CO

PO Box 55, Adairville
Mgr: A W Montgomery
NEW HOLLAND MINE, Hermitage, open pit, bauxite
CAVENDER & THIGPEN MINE, Andersonville, open pit, bauxite
Gen Mgr: A W Montgomery
Geol: Dr H E Cofer, Jr
Supt of Mng: R V Shell
MILL, Adairville
(See Ark, Fla, N Y, Va)

AMERICAN TALC CO

Chatsworth
Pres: M W Glenn
VP: F T Glenn
Sect: J R Perry
SHOP TUNNEL, 3 mi E of Chatsworth, talc, soapstone
Prod: 200 tons
Mine Supt: Garvin Swanson
350-TON MILL, Chatsworth
Mill Supt: James Johnston
Mill Frnt: Walt Weaver
(See Ala)

APPALACHIAN MINERALS CO

Box 350, Monticello
VP & Gen Mgr: B C Burgess
Monticello, feldspar
Ch Eng: L L McMurray
(Subsidiary of Pacific Tin Consol Corp)

BARYTES MNG CO

Box 234, Cartersville
Pres: A W Wood
MINE, Cartersville, barite

BESTWALL GYPSUM CO

Savannah
Pres: R G Lisars
MINE, Gypsum

BRANNON, A H

Ilwaco
MINE, Corundum

COHUTTA TALC CO, THE

Box 828, Dalton
Pres: L F Starr
VP: L B Farrar
Sec & Treas: S A Farrar
FORT MINE, 7 mi E of Chatsworth, undergr, talc & soapstone
Gen Supt: Robert Enslay
Prod: 100 tons
100-TON MILL, Chatsworth
Mill Frnt: C M Young

FELDSPAR CORP, THE

(Appalachian Minerals Co)
Monticello
MINE, open pit, feldspar
Gen Mgr: Carroll Rogers, Jr
Mgr: T L Willis
Gen Supt: R W Hughes
Eng: L L McMurray

Chem: Donald Polk FELDSPAR 1000-TON FLOT MILL

at mine
Mill Supt: H M Hickey
(Subsidiary of Pacific Tin Consol Corp, N Y)

(See N C, Tenn, Conn, Ga)

FUNKHOUSER MILLS, THE

Div of Ruberoid Co
Hartwell
MINE, mica
Plant Mgr: F C McConnell

GEORGIA MARBLE CO, CALCIUM PROD DIV

Tate
Pres: John W Dent
Gen Mgr: Wm B Tate Jr
Purch Agt: T M Shaw
NEW YORK MINE, Tate, undergr, limestone
Mine Supt: E Waldrop
Mech Supt: J D Hagdale
Prod: 1200 tons per day
1300-TON SCREEN, WET & DRY MILLS (3)
Mill Supt: J B Jones, Loy Hammondfree

GEORGIA TALC CO

Chatsworth
Pres: M Woodward Glenn
MINE, talc

GLENN-REY CORP

Francis T Glenn, Chatsworth
MINE, Hudspeth County, Tex, talc, soapstone
(See Tex)

HODGE MINING CO

118 W Cherokee Ave
Cartersville
Own: J N Hodge
Sec: M T Shaw
HODGE MINE, 14 mi N of Cartersville, Fe
Supt: Clyde Shaw
Prod: 375 tons
MINE, Bartow County, surface, Fe

LIBERTY GOLD MINE

4922 Blair Circle, Atlanta 10
NE

Own & Opr: Leonard Markun
LIBERTY MINE, Sugar Hill, undergr, Au, Ag
Under devel
35-TON FLOT GRAV MILL, at mine

MINERALS & CHEMICALS CORP OF AMER

Menlo Park, New Jersey
KAOLIN MINES, Gardner, McIntyre, Wilkinson & Washington Co, open pit
Mgr: A C Todd, Jr
(See N J, Va, Fla)

NATIONAL GYPSUM CO

Savannah
MINE, Gypsum
(See N Y)

NEW RIVERSIDE OCHRE CO

Box 370, Cartersville
Mgr: Pat J R Dellinger
Gen Mgr: W B Hawkins, Jr
MINE, River Road, open pit, barite, ochre
Gen Supt: John H Cobb
Mine Supt: Clifford Mansfield
Prod: 80 tons
80-TON FLOT-GRAV MILL, at mine

PACIFIC TIN CONSOL CORP

(See The Feldspar Corp & Appalachian Minerals Co)

PAGA MNG CO

Cartersville
Supt: A O Franz
MINE, Cartersville, barite

PATULA MNG CO

Cuthbert
MINE, Benevolence, Bauxite

POSS, W M

Union Point
MINE, Feldspar

POWATHAN MNG CO

671 Windsor Mill Rd
Baltimore 7, Md
Pres: Fred A Meit
GAY & CORNELIA MINES, Dillard, asbestos
Supt: H M Pitts
(See Md)

PRICE MINERALS, INC

2300 SW 27th Ave
Miami, Fla
Pres: W T Price, Jr
MINE, LaGrange, beryl, mica
Coordinator: T E Braswell

SOUTHERN TALC CO

Box 373, Chatsworth
Pres: M Woodard Glenn
MINE, Chatsworth, talc

UNITED CLAY MINES CORP

Bandersville
MINE NO 8, open pit, kaolin
Mine Supt: W J Smith
Asst Supt: Roger M Carlson
MILL, at mine
(See Fla, Md, N J, S C, Tenn)

WILLINGHAM LITTLE STONE CO

316 Healey Bldg, Atlanta
MINE, Whitestone (large undergr opening) Dolomite

IDAHO

ABERDEEN IDAHO MNG CO

410 Bank St, Wallace
ABERDEEN-IDAHO GROUP, Shoshone County, Au, Ag, Cu, Pb, Zn
Under devel by the Bunker Hill Co

ABOT MINING CO

Box 1010, Wallace
Pres: Rollin Farmin
MINE, undergr, Pb, Ag
Under devel

ADELMANN BROS MINES GROUP

621 Idaho St, Boise
Sec-Purch Agt: C R Adelmann
IDAHO BORREL HORSE, BLUE GROUSE & EXTS, undergr, Au, Ag
Geol-Elec Eng: Wm A Adelmann
Mech Eng: J P Adelmann
Met: A G Adelmann
24-TON GRAV MILL, Black Hornet mag dist
Mill Supt: J P Adelmann

AGENCY CREEK THORIUM & RARE METALS CORP

Salmon
Pres & Mgr: J R Goggins
Sec: C J Moore
Agent: P F Franks
MINE, Tendoy

ALICE SILVER-LEAD MNG CO

Box 469, Wallace
Pres: O L Jones
Sec-Treas: H F Magnuson
Idle

AMERICAN SILVER MNG CO

123 W 4th Ave, Spokane, Wash
VP: J M Henneke
Sec-Treas: L B Conrad
MINE, 1 mi S of Osburn, undergr, Cu, Au
Under devel by Hecla Mng Co
(See Wash)

AMERICAN SMELTING & REFINING CO, N W MNG DEPT

Box 440, Wallace
Mgr: J C Kieffer
Ch Geol: P I Conley
Ch Eng: R F Pettit, Jr
Supt of Mines: W J Coombe
Supt of Mills: G A Deshler
Elec Supt: A W Beck
Mech Supt: S W Ward
Purch Agt: J P Polla
PAGE MINE, Pb, Zn, Ag
Supt: T M Tower
Asst Supt: C J Ward
Frm: Al Young, Richard James
MORNING MINE, undergr, Pb, Zn, Ag
Mine Supt: H H Shook
Idle
JACK WAITE MINE, Duthie undergr, Pb, Zn, Ag
Supt: C H Blackwell
Frm: H F Legault
240-TON MILL, concentrator
(Operated under agreement)

with Jack Jaffe Mining Co)
GALENA UNIT, 3 mi W of
Wallace, undergr. Ag, Pb
Supt: Norman Vines
Mine Supt: G B Christian
Mine Frnt: E Lomas
350-TON MILL, concentrator
Mill Frnt: M Hopkins
(See Callahan Mng Corp)
(See Ariz., Calif., Colo., Ill., Md.,
Mont., Nev., Nev. N. J., N. Mex.,
N. Y., Tex., Utah, Wash. &
Federal Mng & Smelting Co., Mo.)

ANACONDA CO., THE

25 Broadway, New York 4, NY
Conda, Idaho
Pres: C M Brinkerhoff
Exec VP: E S McGee
Sec & Treas: R E Schneider
VP, Chg West Oper: E I Renouard

Mgr of Mines, West Mng Oper:
M K Hanifan

Gen Supt of Mines: A R Simms,
Ch Eng: C J Lundborg
PHOSPHATE MINE, Conda,
open pit, phosphate rock
(Opr by J R Simplot Co)
1000-TON CRUSHING, WASH-
ING & DRYING PLANT, Conda
(See Calif., Mont., Nev., N. Mex.,
N. Y.)

ATLAS MNG CO

Idaho
Pres & Mgr: R W Greenough
Sec: H J Hull
MINE, undergr. Pb, Ag, Cu,
Zn
Idle

BBB & M MNG CO

2433 N LeCrosse, Spokane 13
Wash
PLOWBOY MINE, Northern
Idaho, Bonner County, undergr.
Pb, Ag
Mine Eng: Cline E Tedrow
Under devel
(See Wash.)

BANNER-IDAHO MINES, INC

Scott Bldg, Wallace
Pres: John Davis
VP: C W Bentley
Sec-Treas: J W Coumerrin
Asst Sec: N F Magnuson
Idle

BAYHORSE MINES, INC

Idaho
MINE, undergr. Ag, Pb
(Property leased from Ramshorn
Mines Co, Salt Lake City, Utah)

BEAR TRACK MINE

Warren, or 14833 San Jose
Ave, Compton, Calif
Ownt: Alvin Mayes, Alton
Mayes

BEAR TRACK GROUP, Warren

undergr. Au, Platinum, Ag
Under devel

LUCKY STRIKE #1 & 2, BLUE

BELL #1, 2, & 3 MINES,
undergr.
Under devel

BEN HUR GOLD, INC

Box 2853, Boise
Pres & Mgr: E C Heffner
Sect: E M States
MINE, Idaho City
MILL, 10-ton Development

BIG DIVIDE MNG CO

1221 5th St., Coeur d'Alene
Pres: C F Buchanan
Sect: J F Maxwell
MINE, Gem

BIG PAY DAY MNG CO

Sandpoint
Pres & Mgr: R C Bower
MINE, Bonners Ferry
Idle

BLACK BEAR MINES CO

Wallace
VP & Mgr: S F Gentry
Sect: D Goggin
MINE, Leland Dist, undergr.
Ag, Pb, Zn
Idle

(Metropolitan Mines Corp

taken lease since 1/1/58)

BLACK BEAR SILVER-LEAD MINES, INC

Box 847, Wallace
Pres: Geo F Ringel
BLACK BEAR GROUP, near
Gem, Shoshone County, Ag

Pb, Zn, Cu
(Leased from Black Bear Mines
Co & being developed by
Metropolitan Mines Corp)

BLACK PINE MNG CO

Salt Lake City, Utah
Pres & Mgr: W Stokes
Sect: T L Cochran
MINE, undergr. Cassia Co,
Ag, Au, Pb, Zn
Under devel

BLACK ROCK MINES, INC

1306 2nd Ave, Seattle, Wash
Pres: R R Armstrong
Sect: S A Lioning
Mgr: J C Martin
MINE, Ketchum
Idle

BLUE WING MNG CO, LTD

Box 741, Wallace
Pres: N Zanetti
Sect: J Zanetti
MINE

BRADLEY MINING CO

Bradley Field, Boise
YELLOW PINE MINE,
Stibnite, undergr. & open pit,
Wyo., Sh, Au, Ag
Mgr: Edwin Adams
Idle

DMA MINE, Patterson, undergr.

Wyo., Ag, Cu, Pb
Mgr: J A Miller
185-TON GRAV-FLOT MILL,
Patterson
Idle

(See Calif.)

BUNKER HILL CO., THE

Box 29, Kellogg
VP: W G Woolf
VP-Gen Mgr: Chas Schwab
Purch Agt: Clifford Mayes
Cont: B N Ramstedt
Mgr, Empl & Pub Rel: B F Mahoney

Mine Mgr: Joe Gordon
Ch Geol: R H McConnell
Mgr, Plant Ser: L M Griffith
BUNKER HILL & CRESCENT
MINES, undergr. Pb, Ag, Zn
Mine Mgr: Joe Gordon
Mine Supt: E B Olds

Asst Mine Supt: Chas Hathorn
Ch Mine Chem: Irving Laskey
Mine Frnt: Paul Sloan,
Don Wilson

Ch Mine Engr: Austin Park
Mine Maint Supt: Lea Vance
Prod: 1,800 tons

3500-TON FLOT CONCENTRA-

TOR, Kellogg
Mill Supt: Norman J Sather
Mill Frnt: Paul Tiesse
LEAD SMELTER, Kellogg
Mgr of Met: A Y Bethune
Supt: George Dunn

Asst Supt: Donald Ingvaldstad
Smelter Maint Supt: Tom Tapper
Ch Chem: L W Burgess
Prod: 100,000 tons yry

ELECTROLYTIC ZINC PLANT,

Kellogg
Supt: Walt Schmittroth
Asst Supt: Sam Keller
Maint Supt: C H Neubauer
Ch Research Met: Gregory Popoff

Ch Research Chem: Leo Baumister
Prod: 72,000 tons
STAR MINE, Burke (Operated
by contract by Hecla Mng Co)

RED BIRD MINE, Clayton

undergr. Pb, Ag
(See Calif., Wash.)

CALLAHAN MNG CORP

100 Park Ave, New York 17,
NY
GALENA MINE, Wallace,
undergr. Ag, Cu
Prod: 300 tons per day
(Leased to Amer Smeltg & Refin
Co)
(See NY)

CAMAS URANIUM MNG & DEVEL CO

Gooding
Opr: Donald F Vaught &
Lowell Fields
20 CLAIMS, Little Smoky Dist,
Camas County, undergr. Au, Ag,
Pb, U₃O₈
Under devel

CENTRAL FARMERS FERTILIZER CO

Georgetown
MINE, Bear Lake Co,
Phosphate, open pit
Gen Mgr: W Tillotson
MILL
(See Ill.)

CHAMPION MINE

Box 61, Mackay
Pres: J L Ausch
MINE, 9 mi S of Mackay,
undergr. Pb, Cu, Ag
Idle

CHESTER MNG CO, LTD

Wallace
Pres & Mgr: L J Randall
Sect: D W Marshman
MINE, Pb, Ag, Cu
Idle

CLAYTON SILVER MINES

Box 890, Wallace
Pres: N M Yeaman
VP: John Preissner
Sec-Treas: Ray Morrison
MINE, Clayton, undergr. Pb,
Ag, Zn

Gen Mgr: Norman M Smith
Gen Supt: R J Legard
Elec Engr: Dick Settles
Mine Supt: Fred Laufinger, Jr
Prod: 100 tons

100-TON FLOT MILL

CLEARWATER MINES, INC
401 Empire State Bldg
Spokane, Wash
Pres & Mgr: H G Loop
Sect: E I Fisher
Agent: J G Towles
MINES, undergr. Cu, Pb,
Ag, Au, Shoshone Co
(See Wash.)

COEUR D'ALENE MINES CORP

303 Gyde Taylor Bldg, Wallace
Pres: H C Mowery
Sect: W A Callaway
MINERAL POINT MINE,
Osburn, 1 mi S of Osburn, Ag,
Cu
Under devel
(Operated by Polaris Mng Co)

800-TON FLOT MILL

COEUR D'ALENE SILVER
GIANT, INC
Box 838, Kellogg
Pres & Gen Mgr: Harry G
Alway
Sec-Treas: C Whalen
MINE, E Fork of Big Creek,
Kellogg, Ag, Pb
Idle

\$2 LOSE CLAIMS, Shoshone

County, under working contract

CONJECTURE MINES, INC

328 Wiggett Bldg
Coeur d'Alene
CONJECTURE MINE, Lakeview
Lead via Bayview, undergr. Ag,
Pb, Zn, Cu, Au, Sh
(Under devel by Federal
Uranium Corp)
(See Wash.)

COPPER CAMP CO

2721 Rose Hill St, Boise
Pres: C A Ray
Sect: D H Peterson
MINE, Valley Co, undergr.,
Au, Ag, Cu

CORDERO MNG CO

131 University Ave, Palo Alto
CALIF
VP: S H Williamson
Gen Mgr: J Eldon Gilbert
WLD HORSE MINE, Mackay, 35
mi W of Mackay, undergr. Ca
WO₃
Asst Gen Mgr: V P Haas
Gen Supt: Edward Hager
Idle

50-TON GRAV MILL, at mine

(See Calif., Nev.)

DAY MINES, INC

Box 1050, Wallace
Pres & Gen Mgr: Henry L Day
Asst Gen Mgr: Rollin Farina
Sect: S F Heitfield
Purch Agt: O T Kelton
DAYROCK, MONITOR,
TAMARACK, HERCULES
MINES, Wallace, undergr.,
Pb, Ag, Zn

Gen Supt: C E Sparks
Prod: 480 tons
4 FLOT MILLS
Mill Supt: L A Grant
3 Mills, Idle

DELMAR MNG & MLG CO

N 5018 Lincoln
Spokane 19, Wash
Pres: Norman E Mills
VP: Odolph Okerit
Sect: Harry O Klaus
MINE, Salmon, undergr. Au, Ag
Mine Supt: Irvin Erickson
Under devel

25-TON GRAV MILL, at mine

(See Wash.)

DOBSON PASS LEAD & SILVER MINES, CORP

314 High Bank St, Wallace
Pres: M D Anderson
Sect: A J Teske
Mgr: P Anderson
MINE

DOUGLAS MNG CO

PO Box 29, Kellogg
VP: W G Woolf
Sect: Robert E Brown
DOUGLAS MINE, Pine Creek,
13 mi SW of Kellogg, Pb, Zn, Ag
Idle

E-DAH-NOW URANIUM, INC

Box 646, Salmon
Pres, Mgr & Agent: W W Lowe
Sect: P N Shockey
MINE, U₃O₈

ECHO BAY LEAD-SILVER MINES, INC

Box 93, Coeur d'Alene
Pres & Mgr: E C Shaeffer
Sect & Agent: S E Smith
MINE, Bayview

ESPERANZA GOLD DIKES MNG CORP

904 N Pacific, Pasco, Wash
Pres: M G Johnson
Agent: A R Johnson
MINE, Orogrande Dist
Idle

FEDERAL URANIUM CORP

1278 S 3rd West St
Salt Lake City, Utah
CONJECTURE MINE, Lake-
view Landing via Bayview,
Bonner County, undergr. Au,
Ag, Cu, Pb, Zn

Gen Mgr: R W Neyman
Asst Gen Mgr: L R Messerly
Gen Supt: Walter Campbell
Geol-Ch Eng: A B Newman
Under devel
(Leased from Conjecture Mines,
Inc)
(See Utah)

FERN MNG CO

Day Bldg, Wallace
Pres & Mgr: H L Day
Sect: R W Anno
MINE

GEM STATE CONSOLIDATED MINES, INC

3620 Sycamore Dr, Boise
Pres & Mgr: T R Baugh
Sect: Monica Etsall
MINE, Eagle

GIBBONSVILLE PREMIER GOLD MINES, LTD, INC

620 Fernwell Bldg,
Spokane, Wash
Pres: H M Vasey
Mgr: B C Burnaby
Sect: S Edelstein
MINE, Gibbonsville, Au
Idle
(See Wash.)

GOLCONDA LEAD MINES

Scott Bldg, Wallace
Pres & Gen Mgr:
VP & Treas: H F Magnuson
Sect: Dan H Camp
GOLCONDA MINE, 3 mi E of
Wallace, undergr. Pb, Ag, Zn
Idle

300-TON FLOT MILL, Mullan

Rd, Wallace
Idle

GOLD CANYON MNG CO, INC

1045 N Lincoln, Pocatello
Pres & Mgr: H L Carlyle
Sect: W H Carlyle
MINE, Mackay, Au

GOLD HUNTER MNG CO

Wallace
Pres & Mgr: H L Day
Sect: R W Anno
MINE, Shoshone Co, undergr.,
Pb, Ag, Zn

GRANADA LEAD MINES, INC

Scott Bldg, Wallace
Pres: Ross Rounady
VP: Wray Featherstone
Sect: John Peasack
Treas: H F Magnuson
GRANADA MINE, 3 1/2 mi E
of Wallace, Pb, Ag, Zn
Gen Mgr: Wray Featherstone
Under devel

HECLA MNG CO

Box 320, Wallace
Pres: L J Randall
VP: R E Soronson, H J Hull
Sec-Treas: John R Matthews
Purch Agt: R G Hull
STAR, POLARIS-SILVER
SUMMIT & RADON MINES,
Burke, undergr. Zn, Pb, Ag
Mgr Mines, William H Love
Gen Supt: Williams Anderson, Jr
Ch Geol: H E Harper
Mech Engr: Harry Graff
Elec Eng: N Huhta
Mine Supt: William Dunphy
(Star)

Mine Frnt: L E Arnold

(Star)
Mine Engr: Wallace Crandall
STAR
Prod: 800 tons

POLARIS-SILVER SUMMIT

Prod: 100 tons
RADON
Prod: 250 tons
(Owned by The Bunker Hill Co)

800-TON FLOT MILL, Burke
Zn, Pb
Mill Supt: Gordon Craig
Mill Frnt: Robert Miller
Assayer: Thomas Hydorn
(See Utah)

(See also Lucky-Friday Silver
Lead Mines)

HIGHLAND-SURPRISE CONSOL MNG CO

Box 889, Gyde-Taylor Bldg
Wallace
Pres: Henry C Smith
Sec-Treas: W A Callaway
HIGHLAND-SURPRISE MINE,
Kellogg, 15 mi SW of Kellogg,
undergr. Zn, Pb, Ag
Idle

300-TON FLOT MILL

Idle

HOLLY CORP

406 Lexington Ave
New York, N Y
Pres: S B Harris
VP: Charles Chusano
HERMES MINE, Yellow Pine,
undergr. open pit, Ag
Gen Mgr: James C Brassfield
Prod: 150 tons ore

300-TON FLOT MILL, at mine
(See NY)

HORN SILVER MNG & MLG CO

Box 1010, Wallace
Pres: Henry L Day
Sec-Treas: R W Anno
MINES, 3 mi S of Wallace, Ag,
Pb, Cu
Idle

HUNTER CREEK MNG CO

908 W Sprague, Spokane,
Wash
Pres & Mgr: L Howe
Sect: C C Anderson
MINE, SHOSHONE CO, Ag, Pb,
Zn

HYPOTHEEK MNG & MLG CO

510 Bank St, Wallace
VP: Sig Torkelson
OLD HYPOTHEEK & KING OF
PINE CREEK MINES, Kingstun
Au, Ag, Pb
Idle
(See Mont., Utah, Wash & King of
Pine Creek Mng Co, Idaho)

IDAHO CONSOL MINES INC

4109 Arcade Bldg
Seattle 1, Wash
Pres-Purch Agt:
Edmund G Wilson
VP-Treas: Fred J Weirlich
Sect: Robert J McConnell
TWIN PEAKS MINE, Salmon,

18 mi S of Salmon on US Hwy
93, 3 1/2 mi off Hwy at Twin
Peaks Bridge on Salmon
River, undergr., Pb, Cu, Ag
Gen Mgr-Gen Supt-Mine Supt:
Charles Kapp
Asst Gen Mgr-Asst Mine Supt:
Don E Nicholas
Geol-Mine Eng:
Allen C Merritt
Prod: 100 tons per day
150-TON MILL, at mine
Mill Supt: Don E Nicholas

**IDAHO CUSTER SILVER-
LEAD MINES, INC**
Box 469, Wallace
Pres: Alvo V Altonalshon
VP: O O Miller
Sec & Treas: H F Magnuson
LIVINGSTON MINE, 16 mi S
of Clayton, Pb
200-TON MILL
Idle

**IDAHO LAKEVIEW MINES
CO**
301 Columbia Bldg, Spokane 4
Wash
Pres & Mgr: J L Drumheller
Sec: L R Gordan
MINE, Bayview, Idaho, undergr.
Ag, Pb, Zn
Under devel

(Property now in possession
of Federal Uranium Co acting
as Agent for Idaho Lakeview
Mines Co)

(See Idaho, Federal Uranium Co)

IDAHO MNG & MLG CO
407 Main St, Lewiston
Pres & Gen Mgr: Phillip W
Jungert
VP: Karl R Samson,
Austin H Backus
Sec-Treas & Asst Gen Mgr:
Marion C Jungert
FLORENCE BASIN PLACERS
Florence, 40 mi S of
Grangeville, placer, Au, Ag
monazite, Ti, Zr, rare earths
Gen Mgr & Mine Supt:
Phillip W Jungert
Gen Supt & Asst Mine Supt:
Marion C Jungert
Prod: 2500 yds

**IDAHO MNG & SMELTING
CO**
100 S 9th St, Boise
Pres: T L Rye
Sec: Erna W Potter
Agent: C F Burke
MINE, Cambridge

**IDAHO WILLOW CREEK
MNG CO**
Wallace
Pres & Mgr: W Zanetti
Sec: H F Magnuson
MINE, Shoshone Co, Pb, Ag
**IDAMONT LEAD-ZINC
MINES CO**
South 232a Lincoln St
Spokane, Wash
VP: B A Smith
Sec: W B Russell
MINE, Leonia, Idaho, Au, Ag
Pb, Au, U₃O₈
Under devel

INSPIRATION LEAD CO
W 909 Sprague Ave
Spokane 4, Wash
Pres: E H Carlson
VP-Sec-Treas & Gen Mgr:
W T Anderson
Purch Agt & Asst Gen Supt:
R R Weideman
INSPIRATION SILVER ORE
MINE, Box 239, Wallace
Dago Gulch, Osburn, undergr.
Pb, Ag, Zn
Mine Supt: Ellery Kothbauer
Idle
(See Utah)

**KERN COUNTY LAND
COMPANY**
Consulting Geol representing
Kern County Land Company:
David L Moore, 406 McCarty
Bldg, Boise
Mgr, Minerals Dept:
Wm T Griswold
(See Ariz, Calif, Utah)

**KIMBERLY GOLD MINES,
INC**
Box 62, Tacoma, Wash
Pres: O T Otness
Sec: L F DeLorock
Mgr: R H Nelson
Agent: Wm Dee
MINE, Marshall Dist, Idaho

**KOPPER KING MNG CO,
THE**
180 S Cleveland, Blackfoot
Pres: W H Smith
Sec: W H Smith
MINE, undergr., Cu, Ag, Au, Pb
Under devel

KURISH, JAMES E
1622 8th Ave, Sweet Home,
Ore
FREE GOLD MINES, Pierce
dist, Clearwater County
undergr placer, open pit, Au
rare earths
Gen Mgr: Jas E Kureish
Asst Gen Mgr: Dave Oliver
Gen Supt: Clara Bloomquist
Idle
35-TON GRAV MILL, Pierce
dist

**RECTOR FURNACE
LEESBURG MNG CO**
2403 S Tacoma Hwy, Tacoma
Wash
Pres: L Antonette
Sec: N B Cowan
Mgr: A G Nickelsen
MINE, Salmon, Idaho
Idle

**LITTLE QUEEN MINES,
INC**
Alaska
Pres: H D Hollenbeck
Sec & Mgr: H M Greenwald
MINE, undergr. Au, Ag, Pb
Zn, W₂O₃
50-TON MILL
Under devel

**LUCKY FRIDAY SILVER-
LEAD MINES CO**
Box 320, Wallace
Pres: L J Randall
VP: H F Magnuson
Sec-Treas: D McPherson
Asst Sec-Treas: B French
LUCKY FRIDAY MINE, 1 mi
E Mullan, Hunter dist, Pb,
Ag, Zn
Gen Mgr: Wm H Love
Gen Supt: Williams Anderson, Jr
Ch Geol: H E Harper
Ch Engr: W F Crandall
Mine Supt: Dave Elder
Asst Mine Supt: Wray
Featherstone

Geol: P E Hyde
Mine Engr: Wm Folwell
Prod: 500 tons
500-TON FLOT MILL, at mine
Mill Supt: Gordon Craig
Asst Mill Supt: Chas Kidwell
Mill Frm: Ben Holdaway
Assay: Tom Hydora
(Control & operations by Hecla
Mng Co)

**MAJESTIC SILVER LEAD
MINES, INC**
112 S Division, Kellogg
Pres: H U Braas
Sec: C V Geraghty
MINE
Idle

MARR, FRANK N
611 Payton Bldg, Spokane
Wash
BUNKER HILL (lease) Box 350
Kellogg, undergr., Pb, Ag, Zn
Gen Mgr: C F Redding
Mine Frm: Milton Turley
Prod: 50 tons
150-TON FLOT MILL, Wardner

**MARTH CREEK MNG
CORP**
844 E Van Buren, Phoenix
Ariz
Pres: Alice E Mallen
Agrnt: C W Northwine
BULL HIDE MINE, Pine,
Idaho, Au
RAW HIDE MINE, Au
(See Ariz)

MASCOT MINES, INC
Box 989, Kellogg
Pres: Malcolm C Brown
VP & Purch Agt: Dunham Bell
Sec-Treas: H F Magnuson
LITTLE PITTSBURGH MINE,
Paw Creek, Kellogg, undergr.
Au, Pb, Ag
Idle
150-TON FLOT MILL, Pine Cr
Idle
(See Utah)

**METALINE & PINE
CREEK CONSOL MNG CO**
Scott Bldg, Wallace
Pres: Stanley Easton
VP: J M Haffner
Sec: L J Randall
Asst Sec: H F Magnuson

**METROPOLITAN MINES
CORP, LTD**
810 Bank St, Wallace
Pres & Mgr: J T Kingsbury
Sec-Treas: A J Teske
METROPOLITAN GROUP,
Shoshone County, Ag, Pb, Cu
(Under devel by Sunshine Mng
Co)
(See Black Bear Silver-Lead
Mines Inc)

MONARCA MNG CO
208 N 15th, Boise
Pres & Mgr: E R Lindquist
MINE, Owyhee Co, Ag
Under devel

**MONSANTO CHEM CO
INORGANIC CHEM DIV**
Soda Springs
Plant Mgr: P P Hendrickson
Prod Supt: R H Crouse
Main Supt: J H Canaan
Plant Buyer: G F Dupis
Personnel Supt: J R Smith
BALLARD MINE, 12 mi N of
Soda Springs, open pit,
phosphate rock
Mine Supt: G L Atwood
MILL, 2 mi N of Soda Springs,
rotary kiln
Mill Supt: T V Kramer
ELECTROLYTIC SMELTER, 2
mi N of Soda Springs
(Supt: D L Gillette
(See Mo, Tenn))

**MONTANA COAL & IRON
CO**
Red Lodge, Mont
Pres & Treas: O C Smith
VP & Sec: T C Smith
BLACK PINE MINE, Blackbird
dist, Lemhi County, undergr.
Ag, Cu
Idle until spring

MULLAN METALS, INC
PO Box 131, Wallace
Pres: C E Horning
Sec: W J Emacio
Mgr: D Elder
MINE, Shoshone Co, Pb, Zn, Ag
Idle

**MULLAN SILVER-LEAD
CO**
Scott Bldg, Wallace
Pres: J E McKay
VP: James Doyle, Jr
Sec-Treas: H F Magnuson

NABOB SILVER-LEAD CO
Box 899, Kellogg
Pres: H J Hull
VP: Gen Mgr & Purch Agt:
C C Dumble
Sec-Treas: June H Olsen
NABOB SILVER-LEAD CO MINE
Pine Cr, undergr., Zn, Pb
550-TON FLOT MILL
Mill Supt: E M George
(Mining by Sidney Mining Co)

**NATIONAL SILVER LEAD
MNG CO**
510 Bank St, Wallace
Pres: A M Clement
Sec: R H Kingsbury
Mgr: J T Kingsbury
MINE, Shoshone Co, Pb, Ag
Idle

**NATIONAL URANIUM
CORP**
510 Bank St, Wallace
Pres & Gen Mgr:
John T Kingsbury
CLAIMS, LITTLE JOE MINE,
Rovall County, Mont, U₃O₈
Idle
(See Mont)

NORTH FORK MNG CO
Box 469, Wallace
VP: Vernon J Robinson
Sec: Earl Chilcott
MINE, 18 mi W of Wallace
Idle

**NORTHWEST MINERALS
INC**
PO Box 1344, Spokane-1, Wash
Pres: Forrest M Garrett
VP: H E Bealy
Sec-Treas: Don A Gillis
HUNTER-CONTINENTAL
MINE, Pinehurst, undergr.
Pb, Ag
Gen Mgr: H E Bealy
Geol: H Gratian Lynch
Idle (assessment work only)
(See Wash)

**NUCLEAR FUELS & RARE
METALS CORP, INC**
Focastila
Pres: D B Lewis
MINE, in Lemhi Pass area on
Continental Divide between
Idaho & Mont, Th, Co, Ta,
Rare Earths
Under devel
(See Mont)

OHADI MNG CO
601 First National Bank Bldg
Great Falls, Montana
Pres & Mgr: Wm Collette
Sec: R G Collette
Agent: Miles Painter
MINE, Dixie Dist, Idaho

**OOM PAUL
CONSOLIDATED MNG CO**
Wallace
Pres: C A Tifford
Sec: Mildred R Jones
Mgr: L J Randall
MINE, Shoshone Co, Pb, Ag
Idle

**OXFORD COPPER MNG
CO LTD**
231 First St, Orofino
Pres: A B Curtis
VP, Purch Agt & Gen Mgr:
Robert Oud
Sec & Treas: Carroll Brock
MINE, undergr., Cu, Au
Idle
MILL, near Pierce

**PARK COPPER & GOLD
MNG CO, LTD**
Box 1193, Wallace
Pres: D Ferguson
Sec: J B Beaudict
MINE, Mullan
Idle

PARKER MNG CO, INC
Box 936, Ketchum
Pres: H Comer
Sec: B Brooks
MINE, Blaine Co, undergr.
Pb, Ag
(Property leased)

PAYMASTER, INC
611 Payton Bldg
Spokane 1 Wash
Pres: Frank N Marr
Sec: C D Randall
MINE, 31 mi SW of Arco
undergr.
Idle

**PHILLIPS PETROLEUM
CO**
Box 2178, Boise
Pres: Paul Endicott
Sec: Paul J Parker
Idaho Agt: Frank Martin Jr
MINE, Little Blk Group in
Cold mt in Stanley Basin,
Custer County, Claims
leased from Bill Brooks,
Melvin Peterson & Jules
Kauffman, Halley
Under devel

PLAINVIEW MNG CO
462 Second St, Kellogg
Pres & Mgr: S H Garrett
Sec: C W Simmons
MINE, Shoshone Co, Ag, Pb
Idle

PORTER BROS CORP
Box 867, 2806 Warm
Springs Ave, Boise
Pres: R P Porter
VP & Sec-Treas:
D L Skidmore
Purch Agt: D L Hunt
BEAR VALLEY PLACER, at
Bear Valley, Valley County,
placer, columbite, tantalum
uranium, monazite rare
earths
300 TON GRAV MILL, Lawman
Mill Supt: A L Rose

PRINCETON MNG CO
Scott Bldg, Wallace
Pres: H J Hull
VP: J V Griesmer
Sec-Treas: H F Magnuson
MINE, E of Mullan
Under devel

QUEEN HILL MNG CO
Sandpoint
Pres: H Weaver
Sec: A Abroms
Mgr & Agrnt: Sven Anderson
MINE, Bonanza Ferry

R-G MNG CO., INC
107 Sidney Bldg., Kellogg
Pres, Mgr & Agent: R Klepinger
Sec: W M Blaho
MINE, Wallace

**RAINBOW MNG & MLG
CO LTD**
Box 889, Wallace
Pres: H C Mowrey
Sec-Treas: W A Callaway
RAINBOW #1 GROUP, Evolution
dist, Cu, Ag, Pb, Zn
Under devel by Polaris Mng
Co

RAMSHORN MINES CO
333 Felt Bldg, Salt Lake City
Utah
MINE, undergr, Challis, Ag, Pb
(Property under lease to
Bayhorse Mines, Inc, Challis,
Idaho,)
(See Utah)

**RARE METALS CORP OF
AMERICA**
1st Security Bldg, Salt Lake
City 11, Utah
VP: M H Kline
IDAHO-ALMADEN MINE, Box
627, Weiser Washington
County, open pit, Hg
Mine Supt: H W Horst
Offc Mgr: A G O'Leary
Prod: 175 tons

BEAR VALLEY MINE, Lehm
Co
BROOKS PROJECT, Auster Co,
U₃O₈, Th
175-TON ROTARY KILN MILL
Weiser
Mill Supt: H W Horst
(See Ariz, N Mex, Utah)

**REINDEER-QUEEN MNG
CO**
Scott Bldg, Wallace
Pres & Mgr: C A Tifford
Sec: H F Magnuson
MINE, Mullan
Idle
**RHODE ISLAND MNG CO
LTD**
Box 741, Wallace
Pres: N Zanetti
Sec: J Zanetti
MINE, Osburn
Idle

RICHARDSON PLACERS
Box 786, Salmon
Gen Mgr: O E Shoup
RICHARDSON PLACERS,
Leesburg, placer, Au, Ag
petrified wood opalized
Gen Mgr: O E Shoup
Prod (the summer only):
placers: 1,600 yds
MILL: hydraulic & sluice

RICHLAND MINES INC
PO Box 5648, Boise
Pres: Henry L Johnson
VP: Roy A Norquist
Sec: Martin Newman
RICHLAND GROUP, Placerville
undergr., Ag, Pb, Zn, Au
Idle

**ROCKCREEK SILVER-
LEAD CO**
2006 W Riverside Ave
Spokane, Wash
Pres: F Messer
Sec & Mgr: J H Christman
MINE, Wallace

ROOD PLACER
Shoup
Own: Frank H Rood
Sec: Hazel Rood
MAEBELL MINE, placer, Au
Under devel

RUBY COMPANY
Box 2777, Boise
Pres: J R Simplot
Sec: L E Haight
Mgr: P T Peterson
MINE, Bovill

**ST ELMO SILVER MINES
CORP**
Pacifi Hotel, Wallace
Pres: A D Wallace
Sec & Agent: D Goggin
Mgr: J B George
MINE, Osburn

ST PAUL LEAD CO
PO Box 750
Kellogg
SNOWSHOE & ST PAUL MINES,
Ag, Pb, Zn
(See Idaho)

**SALMON RIVER
SCHEELITE CORP**

Clayton
Pres: Harvey Penney
VP: Harry F. Nunnkamp
Sec-Treas & Gen Mgr:
James E. Clutts
Asst Gen Mgr: D. P. Lemons
TUNGSTON JIM MINE,
Clayton, Thompson Cr.,
undergr., WO3
Mine Supt: George Wilcox
Prod: 40 tons
Under devel
40-TON GRAY MILL, at mine

**SALMON RIVER URANIUM
DEVEL, INC**

Salmon, I
Pres & Mgr: J. Wilson
Sec: Mary E. Wilcox
MINE, undergr., Northfork,
UOg
MILL, under const

**SAN FRANCISCO
CHEMICAL CO**

Montpelier
Pres & Gen Mgr: D. L. King
VP: W. Jerome Taylor
Sec-Treas-Purch Agt:
Calvin F. Sims
WATERLOO MINE, E of
Montpelier, open pit
phosphate
Met: Jay Twichell
(See Utah, Wyo)

**SAN RAFAEL MINES,
INC**

9001 S 23 East St.,
Salt Lake City, Utah
Pres: O. C. Larson
Sec: Della M. Larson
Mgr: L. T. Reiter
Agent: C. S. Myers
HARD TIMES GROUP MINE,
Hailey
(Mine is under lease)

SAWLOG MNO

Shoup
Gen Mgr: Magnus Bevan
Sec: Hazel Bevan
TWILIGHT MINE, undergr. &
surface, Au, Ag, Pb
Under devel
5 ION GRAY MILL, at mine

**SEAGRAVES MNO CO,
THE**

3439 NE Sandy, Portland, Ore
Pres: W. T. Harmon
Sec: V. D. Warner
Agent: J. Seagraves
MINE, Custer Co, Pb, Ag

**SENATOR SILVER-
LEAD MINING CO**

7 W Mission, Kellogg
Pres: T. Rimmerfeld
Sec: C. B. Forbes
Agent: G. H. McKinnis
MINE, Murray
Idle

SIDNEY MNO CO

102 Sidney Bldg, Kellogg
Pres: M. C. Brown
Sec-Treas: F. E. Marler
Gen Supt: C. A. McKinley
Purch Agt: A. G. Pippo
SIDNEY MINE, 15 mi S of
Kellogg, undergr., Zn, Ag, Pb
Prod: 200 tons
300 TON FLOT MILL, Pine Cr
dist
Supt: C. A. McKinley

SIGNAL MNO CO

410 Main St., Kellogg
Pres: H. G. Alway
VP: John B. Penney
Sec: Wendell R. Brainerd
HILARITY GROUP, 7 mi W of
Kellogg, undergr., Zn, Pb, Ag
Idle

SILVER BUCKLE MNO CO

Box 1088, Wallace
Pres: D. F. E. Scott
VP & Gen Mgr: Clark L. Wilson
Sec-Treas: Alden Hull
Office Mgr: Jack D. Gay
SILVER BUCKLE-VINDICATOR
PROJECT, Wallace & Mullan
Pb, Ag
(See Utah, Wash)

SILVER DOLLAR MNO CO

900 N Sprague Ave
PO Box 123, Spokane 10, Wash
Pres: Elmer E. Johnson
VP: L. E. Nicholls

Sec-Treas: J. T. Anderson
Purch Agt: W. J. Carlson
SILVER DOLLAR MINE, Osburn
undergr., Pb, Ag
Geol: P. E. Oscarson
(See Wash)

SILVER HILLS MNO CO

1258 Crandall Ave.,
Salt Lake City, Utah
Pres: A. A. Farnice
Sec: L. M. Francis
Mgr: B. Spence
Agent: A. C. Hutchinson
MINE, Black Pine

SILVER PIRATE MNO CO

Box 298, Kellogg
Pres: D. J. Diehl
Sec: Mary Nash
Mgr & Agent: A. M. Nash
MINE

**SILVER STANDARD MNO
CO**

E 604 Heroy Ave., Spokane
Wash
Pres: T. L. Shaw
Sec & Mgr: C. M. Shaw
Agent: M. M. Burns
MINE, Osburn

**SILVER STAR MINES
INC**

314 High Bank St., Wallace
Pres: Purch Agt-Gen Mgr:
Phillip G. Anderson
VP: Phyllis McKinnis
Sec: Pearl W. Benson
SILVER STAR MINES, undergr.
Under devel

**SILVER STAR QUEENS
MINES, INC**

900 Trans American Life Bldg
Ft. Worth, Texas
Pres: Jos. A. Foster
VP: Robert Decker
Sec-Treas: T. O. Briggs
Purch Agt: Ralph Thurston
MINE, Box 158, Hailey, 1 mi
W of Bellevue, undergr., Pb
Ag, Zn
Gen Mgr & Met: Ralph Thurston
Gen Supt: Roy T. Fitts
Under devel
(See Tex)

**SILVER SYNDICATE
INC**

Scott Bldg, Wallace
Pres: W. M. Yeaman
VP & Gen Mgr: N. M. Smith
Sec-Treas: Ray Morrison
SILVER SYNDICATE MINE, 10
mi from Walla, e., undergr.,
Cu, Pb, Zn, Ag, antimony
Prod: 100 tons per day
Operated by Sunshine Mng Co

J. R. SIMPLOT CO

(Exec Off) Bank of Idaho Bldg
Box 2777, Boise
(Gen Off) Continental Bank Bldg
Boise

J. R. SIMPLOT

VP: W. Grant Kilbourne
Treas: John M. Dahl
Sec. & Att: Lloyd E. Haight
Mgr: Mines, Geo. G. A. McHugh
Staff Geol: Joe Jemmett, Davis
Schwarze
Asst Mgr: Explo. Div. C. W.
Sweetwood
Treas Mgr: Vern J. Tannlund
Safe & Pwr: Hugh D. Larkin
FERTILIZER DIVN, Box 912,
Pocatello
Gen Mgr: W. Grant Kilbourne
GAY MINE, Near Fort Hall
open pit, phosphate
Res Mgr: O. E. Puthier
Mine Supt: John Clouser
Geol: Norman Lehman
Mine Frm: Tom Hughes
Mine Eng: Robert Hill
Prod: 10,000 tons
BIG CREEK DREDGE, Ada Co,
Ch, Ta, Rv, Th, Ti
SAND SEP PLANT, Ada Co
FERTILIZER PLANT, Pocatello
Plant Supt: Oscar C. Finkleburg
Plant Eng: Keith A. Bithell
Chem Eng: Oscar C. Finkleburg
Auditor: William Hahn
(See Mont, Nev, Wyo)

SNOOSE MNO CO

219 N 17th St., Boise
Pres: N. F. Smith
VP: Mrs. A. M. Jensen
Sec-Treas: R. S. Bacon
SNOOSE MINE, 2 1/2 mi SE of
Hailey, undergr., Zn, Pb, Ag
Idle

SOLAR X CORP

8045 Ustick Rd., Boise
Pres & Purch Agt:
Kenneth Armit
VP: W. E. Thalmann
Sec: Theodore T. Hardy
Treas: T. C. Brown
(See Oregon)

**SPIDER URANIUM MNO
CO, THE**

6 Ives Bldg, Pocatello
MINE, Juab County, UOg

**SPOKANE-IDAHO MNO
CO**

511 Peyton Bldg, Spokane 1
Wash
Pres: Frank N. Marr
Sec: C. D. Randall
Treas: Charles E. Marr Jr
CONSTITUTION MINE, 8 1/2 mi
SE of Pinehurst, undergr., Zn,
Pb
Idle
(See Wash)

**SPOKANE NATIONAL
MINES, INC**

Pine Creek, Coeur d'Alene
Mining Dist, undergr., Ag, Pb,
Zn
FLOT MILL
Prod: 150 tons daily
(See Montana & Wash)
SQUARE DEAL MNO &
MLG CO
Wallace
VP: H. F. Magnuson
Sec: Margaret Galbraith
Mgr: W. Featherstone
MINE, Shoshone Co, Pb, Ag,
Zn
Under devel

SUCCESS MNO CO, LTD

Wallace
Pres: Henry L. Day
SUCCESS MINE, Wallace, Zn
Pb
Idle

SURGOLD MINES, INC

711 Nuton Bldg, Spokane
Wash
Pres & Mgr: W. T. Putman
SUNGOLD MINE, Grangeville
undergr., Au
Idle

SUNSET MINES, INC

PO Box 5187, 1400 N 52nd St
Seattle, Wash
SUNSET MINE, Shoshone Co,
undergr.
(See Wash)

SUNSHINE CONS, INC

102 Sidney Bldg, Kellogg
Pres: Y. M. Yeaman
VP: Ray Morrison
Sec & Treas: F. E. Marler, Jr
Gen Mgr: N. M. Smith
SUNSHINE CONS MINE, 6 mi E
of Kellogg, undergr. Ag
(Under devel by Sunshine Mng Co)

SUNSHINE MNO CO

738 Peyton Bldg, Spokane 1
Wash
Pres: Robert M. Hardy, Jr
VP: C. M. Hull
Sec: Stanton B. Bennett
Treas: Vincent P. Shellan
Purch Agt: H. J. Osborne
Mgr: Mng Div John Edgar
Mgr: Petroleum Div. A. F. Wynn
SUNSHINE MINE, Box 1080,
Kellogg, undergr., Ag, Pb, Cu
Sb
Mgr: H. B. Johnson
Ch Geol: James B. Colson
Ch Eng: James C. Durham
Mine Frm: Charles A. Angle
Prod: 750 tons
1,000-TON FLOT MILL
Mill Supt: Franklin H. Sharp
Asst Mill Supt: Leona N. Barr
Mill Frm: Lyle Cornell
Antimony Plant Frm:
Harold Palmer

SILVER SYNDICATE MINE

(See Silver Syn Mng Co)
SUNSHINE MNO MINE
(See Sunshine Cons)
(See Fairview Placers, Calif)
(See Wash)

TALACHE MINES, INC

111 Grove St., Boise
Pres, Mgr, Agent:
A. H. Burroughs, Jr
Sec: W. A. Griffin
MINE, Elmore Co, undergr.
350-TON AMAL & FLOT MILL

**TEDDY MNO & MLG CO,
LTD**

Star Rte, Box 218, Tacoma
Wash
Pres & Agent: H. A. Miller
Sec & Mgr: E. I. Little
MINE, Kellogg, Idaho

TIN CUP MINE

Cobalt
MINE, 1 mi from Yellow Jacket
undergr., Au, Ag, Cu
Gen Mgr: Hugo A. Simi
Prod: 8 tons
5-TON FLOT-GRAY MILL

TREASUREMENT MNO CO

1129 10th Ave N, Seattle, Wash
Pres & Gen Mgr: W. J. Logus
Sec & Treas: M. A. Logus
QUIGLEY MINE, 6 1/2 mi E
of Hailey, undergr., Pb, Ag
Geol: James M. McDonald
Mine Supt: Al Linderman
Idle

UMONT MNO CO

King St Dock, Burlington, Vt
Pres: L. P. Evans, Jr
Sec: R. H. Wadhams
Mgr: O. P. Wheeler
Agent: R. D. Merrill
MINE

UNITED IDAHO MNO CO

608 Newhouse Bldg, Salt Lake
City, Utah
Pres & Gen Mgr: Roger V.
Puerre
UNITED IDAHO MINE, Gilmore
undergr., Pb, Ag
Idle

UNITED PERLITE CORP

Malas
Pres: M. J. Hess
VP: U. Champney
MINE, Oneida Co, Perlite
Under devel

**URANIUM EXPLORATION
CORP OF IDAHO**

251 Main Ave E, Twin Falls
Pres: Bert A. Sweet, Sr
VP: Emmett Kelly
Sec-Treas: Leonard Mauss
URENCO MINE, Custer County,
North Fork Lost River, 27 mi
from Keetchum, UOg
Under devel

**VITRO IDAHO MINERALS
CORP**

PO Box 67 So Salt Lake
Salt Lake City, Utah
MINE, UOg

WALL STREET MNO CO

Wallace
Pres & Mgr: L. J. Randall
Sec: L. S. Eddins
MINE, Mullan
Idle

WALLACE MNO CO

Box 257, Wallace
Pres: J. C. McKinnick
Sec & Mgr: W. Featherstone
MINE,
Idle

**WAR EAGLE MNO CO,
INC**

114 E Chestnut St, Yakima
Wash
WAR EAGLE MINE, McCall,
undergr., Au, Ag
Gen Mgr: E. W. Peterson
Idle
75-TON HEAVY MEDIA MILL,
McCall
(See Wash)

WASHINGTON MNO CO

Box 638, Wallace
Pres: J. G. Towles
Sec: M. Evans
MINE, Burke

**WEST BELL MNO CO,
LTD**

Box 302, Wallace
Pres: J. F. Markwell
Sec: M. T. Salum
MINE, Shoshone Co, Pb, Ag
Zn, Au

WEST STAR MNO CO

1221 6th St, Coeur d'Alene
Pres: K. H. Blaesser
Sec: H. Stewart
Mgr: A. Markwell
MINE, Shoshone Co, undergr.,
Pb, Ag, Au

**WESTERN FLUORITE
MNO CO, INC**

Box 453, Hailey
Pres: Henry S. Childs
VP: Wilson Hawkins
Sec-Treas: Tom Haley
EAST BASIN & LIGHTNING
GRP, Eastern Basin Cr area,
Stanley Basin, Custer County,
Claim leased from Keith &
Alice Evans, Ketchum, undergr.
open pit, UOg
Supt: Henry C. Childs
Prod: 30 tons
(Mine op under control of
Vitro-Idaho Minerals Corp.)

WESTERN MICA CORP

Box 187, Deary
Pres & Mgr: G. J. Slette
Sec: Jacqueline R. Slette
MINE, open pit, Mica, Beryl

WHELCHER MINES CO

1019 Arthur St, Caldwell
Pres: William E. Whitchell
VP: Ralph A. Whitchell
Sec-Treas: Thressa M. Whitchell
TWIN BUTTES GROUP #1
Owyhee County, Box 7,
Caldwell, rare earth, gypsum
Under devel
(See Nev, Utah)

WHITE KNOB MNO CO

1010 Newhouse Bldg, Salt
Lake City, Utah
Pres: O. A. Glesner
HOMESTEAK, COPPER QUEEN
MINES, Alder Creek, Mackay
Pb, Zn, Ag

**WHITEDELPH EXTENSION
MNO CO**

319 N First Ave, Sandpoint
Pres & Mgr: E. Ahronstet
Sec: R. C. Bower
MINE, Clark's Fork
Idle

**WHITEDELPH MNO &
DEVEL CO**

401 Empire State Bldg
Spokane 1, Wash
Pres-Purch Agt:
Compton I. White
VP: H. G. Loop
Sec-Treas: E. I. Fisher
WHITEDELPH MINE, Clark
Fork, Pb, Ag, Zn
Gen Mgr-Mine Supt:
Compton I. White
100-TON MILL, Clark Fork,
Idaho
(See Wash)

**WONDER LORE CLAIMS,
INC**

Box 756, Salmon
Pres: G. E. Shoup
VP: R. M. Shoup, M. R. Shoup
Sec & Treas: F. H. Smoot
Purch Agt: R. M. Shoup
ABANDONED LORE CLAIMS,
undergr., open pit, Au, Ag, Ta
Rare earths
Mine Supt: G. E. Shoup
Asst Mine Supt: R. M. Shoup

YREKA UNITED INC

Kellogg
Pres: Wendell R. Brainerd
VP: Henry C. Smith
Sec-Treas: C. Whalen
MINE, merged group,
including properties of Altura,
Hill, Mohawk Silver-Lead,
Paramount, Yreka, Calsonica
Silver-Lead, Lead Blossom
New Hilarity, United Mines Mng
Co, on upper Elk Cr, SW of
Kellogg, Shoshone County
Sited for deep-level devel by
The Bunker Hill Co, under
operating agreement

ILLINOIS**ALUMINUM CO OF
AMERICA**

1501 Alcoa Bldg, Pittsburg 19
Pa
Pres: F. L. Magee
VP: L. Litchfield, Jr
Sec: A. M. Hunt
Treas: E. B. Wilder
Purch Agt: R. O. Koefor
Gen Mgr, Raw Materials Div:
George W. Streeby

FAIRVIEW-BLUE DRUMS,
Rosiclare, CaF₂, Pb, Zn
undergr
Works Mgr: W S Skeels
Genl: F E Williams
Mech Eng: H E Elmer
Purch Agt: T H Fallwell
Works Ch Mng Eng:

S U Bouman
Mine Supt: W H Harrison Jr
Prod: 400 tons per day
400-TON-FLOT-HEAV-MED-
MILL, Rosiclare
Mill Supt: W C Lay
Asst Mill Supt: T K Loyd
(See Ark, Ky, Pa)

AMERICAN COLLOID CO

5100 Saffield Court, Stokile
Pres & Gen Mgr: Paul Bechtner
VP & Treas: W D Weaver
VP: E P Weaver
VP: Clyde A Sanders
Asst Sec: Jeanette Dixon
Purch Agt: Roy H Harris
(See Miss, S Dak, Wyo)

AMERICAN SMELTING & REFINING CO

Federal
FEDERAL SMELTER, St
Mgr: L J Buck
Supt: James H Vose
(See Ariz, Calif, Colo, Idaho,
Mo, Mont, Nebr, N J, N Mex,
N Y, Okla, Tex, Utah, Wash and
Federal Mng & Smelting Co,
Ma)

AMERICAN ZINC CO OF ILLINOIS (subsidi of AMERICAN ZINC, LEAD & SMELT CO)

1515 Paul Brown Bldg, St
Louis 1, Missouri
Fairmont City Roasting & by-
product plant
VP & Gen Mgr: G L Spencer, Jr
Gen Supt: George Kromen

Purch Agt: G E James
ELECTROLYTIC SMELTER,
Kewanee
Mgr: T I Moore
Supt of Met: R K Carpenter
Purch Agt: V M Provov
Prod: 34,000 tons hi-grade
slab zinc annually

SMELTING & PROCESSING PLANT, Hillsboro

Mgr: H R Wampler
Supt: Dry Supt: J P Clark
Gen Frm: H J Collett
Oxide Supt: Oscar Hassel
Assay: Orville Rutledge
Prod: 12,600 tons Amer prod
sinc oxide yearly
3,700 tons Fr prod
sinc oxide yearly
7,150 tons slab zinc
yearly
(See Ariz, Mo, Ohio, Okla, N Mex,
Tenn, Tex, Utah, Wash, Wisc)

CALUMET & HECLA, INC

122 S Michigan Ave,
Chicago 3
Pres: H V Bassett
VP-Finance: C C Jang
Sec: A E Petermann
Treas: F J Gibbons
(See Mich, N Mex, N Y)

THE CELOTEX CORP, HANLIN DIV

120 La Salle St, S, Chicago
MINE, Longworth, Fisher
County, Texas, Gypsum
(See Tex)

CENTRAL FARMERS FERTILIZER CO

205 W Jackson Dr, Chicago
Adm VP: J P Cairns
Pres: J L Lanter
Sec: E E Runkback
Agent: J L Eberle
(See Idaho)

EAGLE Picher Co, MNG & SMELTING DIV

Box 1040, Galena
GRAHAM MINE, Galena
undergr, Zn, Pb
Gen Mgr: R L Haffner
Gen Supt: H H Haman
Genl: Wm E Arndt
Maint Supt: Clarence Lyden
Mine Supt: E L Houy
Mine Frm: Harold Nisco
Mine Eng: V E Van Matre
Proj Eng: H B Farrey
Prod: 1,500 tons
GRAHAM MILL, Galena, flot

& grav
Mill Supt: C C Crow
Mill Frm: Glenn Brotzman
Assayers: Ed O'Neil &
Richard Simmons
Prod: 1,500 tons of Zn daily
(See Kans, Nev, Ohio, Okla,
Wisc)

GOOSE CREEK MNG CO

Cave-in-Rock
Purch Agt: C F Patton
MINE, Near Cave-in-Rock,
CaF₂

HERSTROM, H O

2305 12th St, Rock Island
(See Wyo)

HICKORY HILL MNG CO

Galena
HARTWIG MINE, undergr, Pb

HOEB MNG CO

Cave-in-Rock
Pres: F A Hill
VP: B W Bales
Sec-Treas & Gen Mgr:
Lowell Oxford

Purch Agt: Carl Embree
HOEB MINE, undergr, CaF₂
Pb, Zn
Gen Supt: Ray Crabbs
Gen Mgr-Geol: Lowell Oxford

INDEPENDENT SALT CO

415 Packers Ave, Chicago 9
MINE, Kanopolis Kansas, salt
(See Kansas)

INLAND STEEL CO

30 W Monroe, Chicago 3
Chmn: J L Block
Pres: J F Smith, Jr
VP: Raw Materials
Sec: Graydon Megan
Treas: Wm Lowe
(See Mich, Minn)

INTERNAT'L MINERALS & CHEMICAL CORP

AGRI CHEMICAL DIV
5401 Old Orchard Rd, Stokile
Pres: Thomas M Ware
VP, Opns, Agri Chem Div:
David J Sura

Treas: R A Lenon
Supt: C M Edwards
Purch Agt: C F Teeple
(See Ariz, Fla, Maine,
Miss, N Mex, N C, S D, Tenn,
Va, Wyo)

MINERVA OIL CO

FLUORSAP DIV
Div'n Of: Myers Bldg, Box
531, Eldorado
VP & Gen Mgr:
Gill Montgomery

Purch Agt & Sls Mgr:
S J Kelly
MINERVA MINE NO 1,
Cave-in-Rock, undergr,
CaF₂, Zn S

Mine Supt: C F Callahan
Mine Frm: James Charlton
Eng: D B Holbrook
Mng Eng: J J Daly
Geol: Donald W Saxby
Plant Mgr: O E Anderson
Prod: 300 tons per day
325 TON FLOT MILL: CaF₂,
Zn conc

Mill Supt: George H Musson
Chem: C B Rush
Assayer: A C Reed
CRYSTAL MINE, Rt 1,
Elizabethtown, undergr, CaF₂
Plant Mgr: I V Robertson
Mine Frm: Reynard Dutton
Prod: 300 tons per day
750-TON HNS and FLOT MILL
met, grade & Acid grade
fluorspar:
Crystal Mill: Acid & Ceramic
& met fluorspar, sinc & lead
concentrate

Mill Frm: Jas Frailey
Met: D C Speed
VICTORY MINE, Rt 1,
Elizabethtown, undergr, CaF₂
Frn: Harry Gibbs
Research Dir: W T Rule
Prod: 153 tons
JEFFERSON MINE, Rt 4,
Golconda, undergr, CaF₂
Idle

ROSE CREEK MINE, near
Herod, undergr, CaF₂
Idle

BENZON MINE (lease) Rt 61,
Elizabethtown, undergr, open
pit, CaF₂
Idle

GASKINS MINE, Empire dist,

Pope County, undergr, CaF₂
Idle
(See Mo)

MORTON SALT CO

110 N Wacker Dr, Chicago
Pres: Daniel Peterkin
VP: Herbert Stratford,
R C Vail

Sec: L J McBride
Treas: J H Burtch
Purch Agt: N L Eathus
FAIRPORT HARBOR MINE,
Box 380, Painesville, Ohio,
undergr, Rock Salt

Gen Mgr: Russell Ganong
Asst Gen Mgr: Dean McCormick
Office Mgr: Ralph Oliver
Mine Supt: M R Barker
Mine Frm: R May
Mine Engr: R Ryland
under devel
Prod: 4,000 tons

MILL
Supt: Fred Bufta
Asst Supt: R M Rader
Assay: W Eville
(See Kan, La, Ohio, Tex)

NEW JERSEY ZINC CO, THE

Box 110, Salem, Mo
SMELTER, Deque, Zn
Supt: P A Jensen
(See Colo, N J, N Mex, N Y,
Pa, Tenn, Va, Wisc)

OZARK-MAHONING CO, MNG DIV

Box 57, Rosiclare
Pres: C O Anderson
VP & Gen Mgr: A G Johnson
Purch Agt: C W Sonosky
DEARDORFF, W L DAVIS #2,
NORTH GREEN EAST GREEK,
MAHONING MINES, SHAFT #2,
2, 3, 11, 15 & HILL-LEDGARD,
undergr, fluorspar, Zn, Pb

Mine Supt: Edward Powell, Jr
Asst Mine Supt: Wm H Melcher
Mine Frm: J H Scott, J L Price
Prod: 500 tons
300 TON FLOT MILL, at mine
Mill Supt: W A Fowler
Asst Mill Supt: R N Herman
Mill Frm: P N Hobbs
Assay: Wm Smith
(See Colo, N Mex, Okla)

ROSICLARE LEAD & FLUORSAP MNG CO

Rosiclare
Pres: J Blechisen
VP: Bruce Baird
Sec: Treas: Herman G Lauten
Cashier: R A Browning
ROSICLARE MINE, undergr,
fluorspar
Master Elc: P E Howard
Prod: 100 tons
Idle
300-TON FLOT-HEAV-MED
MILL, at mine
(See Ky)

SWIFT & CO

Union Stock Yards, Chicago
(See Fla)

TAMORA MNG CO

Elizabethtown
MINE, undergr, Karbers
Ridge, CaF₂

TEI STATE ZINC, INC

123 Williams St, New York
36, N Y
Pres: R F Playter
VP: V C Allen
Sec: Treas: J H Nicholls
GRAY MINE OPERATION,
Galena, undergr, Zn, Pb
Gen Mgr: V C Allen
Geol: Paul Herbert, Jr
Mine Supt: Joseph J Nolan
Mine Frm: Orville W Luckes
Mine Eng: R J Kuehneman
Prod: 1,000 tons
1,000-TON FLOT GRAY MILL,
Galena
(See N Y, Va)

U S GYPSUM CO

300 W Adams St, Chicago 6
Chrm Bd: C H Shaver
Pres: O M Knode
VP, Op: E Rembert
VP, Manufact: C W Desgray
Dir, Purch: R Giffin
Sec-Treas: F C Stettner
Mgr: Mines: F C Appleyard
(See Calif, Colo, Conn, Ind,
Iowa, Mass, Okla, S D, Tex,
Utah, Va)

VICTOR CHEMICAL WORKS

155 N Wacker Dr, Chicago 6
Pres & Gen Mgr: Rother Weigel
VP: F M Anable, D G Brower
M R Stanley
Sec: F W Hansen
Treas: F S Schwerdt
Purch Agt: M E Jones
(See Fla, Mont)

ZONOLITE CO

135 La Salle St, Chicago
Pres: John B Myers
VP: Dayton L Prouty,
Daniel J Boone, Joe A
Kelley, Robert W Sterrett
VP & Treas: Walter J Bein
Sec: J H Bishop
Purch Agt: Leo O Franz
(See Mass)

INDIANA

NATIONAL GYPSUM CO

325 Delaware Ave,
Buffalo 2, N Y
MINE, Shoals, undergr, gypsum
Pl Mgr: Paul Haag
Mine Supt: Max Abrams
Prod: 1,300 tons
MILL, at mine
(See Iowa, Kans, N Y, Tex, Va)

PLATEAU IRON ORE CORP

711 Hulman Bldg
Evansville 8
Pres: Ira Van Tuyl
VP: A S McGregor
Sec: E C Robinson
Treas: Roy Fiedger
(See Mo)

U S GYPSUM CO

300 W Adams St, Chicago 6
Ill
MINE, Shoals, undergr,
gypsum
Works Mgr: J R Burns
(See Calif, Colo, Conn, Ill,
Iowa, Mass, Okla, S D, Tex,
Utah, Va)

IOWA

BESTWALL GYPSUM CO

Fort Dodge
MINE & PLANT, gypsum
(See Kansas, N Y, Pa, Tex,
Utah)

FORT DODGE LIMESTONE CO

322 S 22nd St, Fort Dodge
Pres: Robert Weip
MINE, open pit

NAT'L GYPSUM CO

Fort Dodge
QUARRY & PLANT, gypsum
Plant Mgr: J B Pitts, Jr
Mine Supt: Wm Canney
Prod: 1,000 tons
(See Ind, Kans, N Y, Tex, Va)

U S GYPSUM CO

300 W Adams St, Chicago 6
Ill
OPEN QUARRY, Ft Dodge,
gypsum
Works Mgr: M E Davidson
MINE & PLANT, Sperry,
Des Moines Co., gypsum
(See Calif, Colo, Conn, Ill,
Ind, Mass, Okla, S D, Tex,
Utah, Va)

KANSAS

B & I MNG CO

Box 305, Picher, Okla
FLORENCE HARTLEY MINE,
Zn, Pb
Idle

AMERICAN SALT

630 New York Life Bldg
Kansas City 6, Mo
MINE, Lyons, Kans, salt
(See Mo)

BARTON SALT CO

1st National Bank Bldg
Hutchinson
Pres: B L Humphreys
VP: R S Humphreys
Sec: C R Allan
Treas: Elizabeth H Summers
BARTON SALT PLANT,
Cleveland & Campbell
hydraulic mng, salt
Plant Mgr: R S Humphreys
Asst Supt: M H Wambogans

BESTWALL GYPSUM CO

130 E Lancaster Ave
Ardmore, Pa
MINE, Blue Rapids, undergr,
gypsum
(See Iowa, N Y, Pa, Tex, Utah)

BLACK, OMA

Cardin, Okla
LINDSEY BUILDERS MINE,
Cherokee Co, Pb, Zn

CAREY SALT CO

Box 913, Hutchinson
Pres: H J Carey, Jr
VP: W D P Carey
VP, Oper: S B Harrell
Sec: D P Johnston
Treas: R N Apple
Purch Agt: F L Johnson
MINE, Hutchinson, undergr,
salt
Gen Mgr: Leo Reid
Mech Eng: Ronald Stone
Mine Supt: Everett Roberts
Prod: 1,000 tons
1,000-TON GRAY MILL,
Hutchinson
Mill Supt: C Millard
(See La)

COLLINS & THOMAS

Commerce, Okla
CHUBB MINE, Cherokee Co,
Pb, Zn

EAGLE Picher Co, MNG & SMELT DIV

Cardin, Okla
LUCKY JEW, BIG JOHN,
BILHARZ, GRACE B, WEBBER
WESTSIDE, BALLARD,
HARTLEY, SHANKS, KEITH,
SWALLEY, SMITH, CLARK
MINES, undergr, Zn, Pb
LEAD SMELTER & ACID
PLANT, Galena
Mgr: Fred Clearman
(See Ill, Nev, Ohio, Okla, Wisc)

INDEPENDENT SALT CO

415 Packers Ave, Chicago,
Ill
SALT MINE, Kanopolis, under-
gr

KERFORD, GEO W QUARRY CO

115 Utah Ave, Atchison
Pres: Geo Ed Kerford
VP-Treas: Lloyd Kerford Jr
Sec: Orland Barnett
Chmn of Bd: Lloyd Kerford
UNDERGROUND WORKINGS
undergr, open pit, limestone,
Gen Supt: Frank Levell
Supt of Maint: J N Hicks
Prod: 300 tons per day

MORTON SALT CO

110 N Wacker Dr
Chicago 6, Ill
SALT MINE, Hutchinson
evapor salt
Gen Plant Mgr: A E Berry
Asst Plant Mgr: D E Bucher
(See Ill, La, Tex)

NAT'L GYPSUM CO

Medicine Lodge
MINE & PLANT, gypsum
Plant Mgr: D C Chade
Mine Supt: Brad Saboda
Prod: 1,000 tons
(See Ind, Iowa, N Y, Tex, Va)

PEOPLE'S CARALAN CO

People's State Bank,
Ellenwood
LITTLE ROCK MINE, Grant
Co, N Mex, Cu
(See N Mex)

PLYE, F R

Baxter Springs
WEBBER BUILDER MINES,
Cherokee Co, Pb, Zn

REA, C H
Baxter Springs
ROBINSON MINE, Cherokee Co.,
Pa, Zn
SEARCY & HENDERSON
MNG CO
Box 281, Picher, Okla
BENDELARI MINE, NW of
Picher, undergr, Zn
WILBUR MINE, Near Treese,
undergr, Zn, Pb
Idle
STOSKOFF MINE, Zn, Pb
Supt: D W Searcy
STONE & THOMAS
Commerce, Okla
CHEROKEE MINE,
Cherokee Co, Pa, Zn

STONE, JIM
Miami, Okla
BENDELARI MINE, Cherokee
Co, Pa, Zn

KENTUCKY

ALUMINUM CO OF
AMERICA
SHOUSE MINE, Joy
Livingston County, CaF₂
Idle
(See Ark, Ill, Pa)

ANACONDA ALUMINUM
CO
1430 So 13th St, Louisville 1, Ky
Pres: A F Cochran
Exec VP: M Lewis
Sec-Treas: E C Taitenhardt
(See Montana)

ATWOOD MNG CO
Salem
MINE, CaF₂

CALVERT CITY
CHEMICAL CO
Box 305, Calvert City, Ky
DYER'S HILL MINE, CaF₂

CRAIGHEAD & COATES
Marion
STALLIONS MINE, CaF₂

CRAVENS, JAMES H
Princeton
TREE MINE, CaF₂

CRIDER, J WILLIS,
FLUORSPAR CO
Marion
PIGMY MINE, BaSO₄

KENTUCKY FLUORSPAR
CO
Marion
Pres & Treas: R N Fraser
VP-Sec-Treas: E W Fraser
Purch Agt: E W Fraser
TWO 100-TON FLOT MILLS,
Marion & Rosiclare, Ill
TWO 3-TON HEAVY-MED MILLS
Marion & Rosiclare, Ill
Mill Supt: W Matthews
Assayr: C L Fraser

MICO MNG & MLG CO
RR #8, Marion
Pres: Albert Ballensson
Sec: Birdie Karnham
MINE, barite, open pit
Gen Mgr: J Shoemaker
Geol: B J Seutrie
Prod: 800 tons raw feed
800-TON GRAY MILL, Marion

ROSLARE LEAD &
FLUORSPAR MNG CO
Rosiclare, Ill
PIGMY MINE, Crittenden
County, undergr, CaF₂
Prod: 30-35 tons
(See Ill)

TINLEY & LOYD
Marion
NANCY HANES MINE, CaF₂

YORK MNG CO
Lancaster
MINE, open pit, BaSO₄

LOUISIANA

BOURBON MNG CO
Marion
GOERING MINE, CaF₂

CAREY SALT CO
Winfield
MINE, Winfield, undergr,
salt
Mgt: W H Cameron
Supt: Al Tracy
Mech Eng: J M Thornton
Mine Frnt: J E Austin
Prod: 500 tons
MILL, at mine
(See Kans)

DIAMOND CRYSTAL
SALT CO, JEFFERSON
ISLAND DIV
918 Riverside, St Clair,
Mich
MINE, undergr

FREEPORT NICKEL CO
Commerce Bldg, New Orleans
REFINERY, Port Nickel
Prod: 50 million lbs Ni per
year, 4.4 million lbs
cobalt per year, 91,000
tons Ammonium sulphate
per year

FREEPORT SULPHUR CO
161 E 42nd St, New York 17
N Y
LOUISIANA DIV, Commerce
Bldg, New Orleans, mines at
Grand Ecaille, Garden
Island Bay, Bay St Elaine,
Chachacha
VP: E D Wingfield
LAKE PELTO, GRAND BLE
MINE
Under devel
(See NY)

INTERNAT'L SALT CO
INC
Drawer 911, Scranton 2, Pa
AVERY ISLAND MINE, Avery
Island, undergr, rock salt
AVERY ISLAND REFINERY,
vacuum & grainier pan evap
(See NY, Pa, Mich)

JEFFERSON LAKE
SULPHUR CO
1408 Whitney Bldg
New Orleans 13
Pres: Eugene H Faust, Jr
VP, Frasch Sulphur Plant
Harvey A Wilson
Charles J Ferry
Treas & VP: L L Lassalle
Purch Agt: Carl McElrath
STARKE DOME, Vinton
Voorhees Mine, Copperopolis
Asbestos
(See Tex)

KAISER ALUMINUM &
CHEMICAL CORP
1924 Broadway, Oakland 12
Calif
PLANT, Baton Rouge, Alumina
Prod: 430,000 tons per year
PLANT, Gramercy, Alumina
Prod: 430,000 tons per year
(See Calif)

MORTON SALT CO
120 S La Salle St
Chicago 3, Ill
MINE, Weeks, salt
Gen Mgr: L J Broussard, Jr
Asst Gen Mgr: Wayne West
Prod: 1,200 tons
(See Ill, Kans, Ohio, Tex)

NATIONAL LEAD CO
BAROID DIV
New Orleans
BARITE PLANT, dry grinding
Plant Supt: D M Middleton
(See Ark, Calif, Colo, Kans,
Mont, Mo, Nev, N Y, Tenn,
Tex, Wyo)

ORMET CORP
Burnside
PLANT, Burnside, Alumina
Prod: 245,000 tons per year
(joint ownership by Olin
Mathieson Chem Corp &
Revere Copper & Brass, Inc)

MAINE

BEERS, ROLAND F.
CAMPBELL, INC
Troy, N Y
Pres: R F Beers
Res Mgr: D E Wyke
MINE, Crawford Pond
Development, Ni
Under devel
BELL MINERALS CO
West Paris
PERHAM MINE, Oxford County
feldspar
Gen Mgr: H W Childs
GRINDING MILL, feldspar

INTERNAT'L MIN &
CREM CORP
5401 Old Orchard Rd,
Shokle, Ill
MINES, Sagadahoc County,
feldspar
50-TON MILL, Topsham
Gen Supt: J C Bramigan
(See Ariz, Fla, Ill, Miss,
N Mex, W C S D, Tenn, Va,
Wyo)

PENOBSCOT MNG CORP
Harborside, Brooksville
Pres: C H Stewart
VP: K D Thomson
Sec: D C Marshall
CAPE ROSIER MINE, undergr,
Ca, Zn, Ag
Gen Mgr: K D Thomson
Under devel

PORTLAND-MONSON
SALT CO
469 Congress St, Portland
Gen Mgr: D A E Edgerston
MINES, Monson, Piscataquis
County, undergr
MILL, Monson, Elec Slate

ROCKLAND-ROCKPORT
LIME CO INC
PO Box 359, 457 Main St
Rockland
Pres-Purch Agt: A E Orff
Treas: C C Douglas
MINES, Knox County, open
pit, limestone
Mine Supt: David R Hoch
Asst Mine Supt:
Donald K Bickford
Prod: 400 tons per day
MILL, Rockland
Mill Supt: David R Hoch
Asst Mill Supt: Karl T Hurd

TOPSHAM FELDSPAR CO
Topsham
Pres: E W Booker
Gen Supt: D R Drenzo
TRENTON MINE, Sagadahoc
County, feldspar, Quartz
Under devel
50-TON GRAY MILL, Cathance
Rd, Topsham

MARYLAND

AMERICAN SMELTING &
REFINING CO
Highland & Eastbourne Aves
Baltimore 14
BALTIMORE PLANT
Mgt: A J Kieff, Jr
(See Ariz, Calif, Colo, Idaho,
Ill, Mont, Neb, N J, N Mex,
N Y, Tex, Utah, Wash, Federal
Mng & Smelt Co, Mo)

CLINCHFIELD SAND &
FELDSPAR CORP
413 Washington Ave, Towson 4
MINE, Marriottsville, Talc
(See N C)

W R GRACE & CO
DAVISON CHEMICAL CO
101 N Charles St, Baltimore 3
Chmn: C F Hockley
Pres: W E McGuirk, Jr
VP: D N Hausman,
W N Wainmough, R Goodall
(See Fla)

HARFORD TALC &
QUARTZ CO, INC
Hail Rd
Pres: E L Dinning, Jr
MINE, Dublin, Asbestos

KAYLORITE CORP
Dunkirk
MINE, Lyons Wharf,
Glauconite

POWATAN MNG CO
8721 Windsor Mill Rd
Baltimore 7
Pres-Gen Mgr: Fred A Mott
VP-Sec: C Silver
Treas: Frances E Mott
Office Mgr: F E Mott
MICAVILLE MINE, Micaville
Asbestos
Mine Supt: Frank Burleson
Prod: 13 tons per day
(See Calif, Ga, NC)

UNITED CLAY MINES
CORP
Foglar
MINE #2, open pit, ball clay
Mine Supt: H Michael Bressa
Prod: 155 tons
50-TON FLOT MILL, at mine
(See Fla, Ga, W J, S C, Tenn)

MASSACHUSETTS

COPPER RANGE CO
24 Federal St, Boston 10
Chmn: J P Lally
Chmn, Exec Comm:
Nelson J Darling, Jr
VP: John V O'Connor, Robt H
Jacobson
Sec: J R Achroyd
Asst Sec: W Peter Carey
Treas: D M Goodwin
Purch Agt: S H Bailey
(See Mich, White Pine Copper
Co, Mich & Mass)

U S SMELTING,
REFINING & MNG CO
75 Federal St (Box 2137)
Boston
Pres: F S Mulock
(See Alaska, Ariz, N Mex,
Utah)

WHITE PINE COPPER CO
24 Federal St, Boston
Pres: W P Nicholls
VP: Robt H Jacobson
Chmn, Exec Comm & Princ,
Exec Opr: Nelson J Darling
Sec: J R Achroyd
Asst Sec: W Peter Carey
Treas: D M Goodwin
Purch Agt: Russell Baird
(See Copper Range Co, Mich &
White Pine Copper, Mich)

MICHIGAN

BESTWALL GYPSUM
120 E Lancaster Ave
Ardmore, Pa
MINE, Grand Rapids, Gypsum
undergr, open pit
(See Iowa, Kans, N Y, Pa, Tex,
Utah)

CLEVELAND-CLIFFS
IRON CO, ORE MNG
DEPT
1460 Union Commerce Bldg
Cleveland 14, Ohio

Chmn-Pres: Walter A Sterling
Exec VP: H S Harrison
VP: Hugh J Leach
VP, Mining: J S Westwater
Supt: Robert M Kimmel
Treas: J P Long
MICHIGAN OPER, Ishpeming
Mgt, Mich Mines:
H C Swanson
Mgr, Ore Devel: S W Sundeen
OHIO-WESTERN MINE, Daraga
County, surface, Fe
Supt: K C Olson
BUNKER-HILL-MAAS MINE,
Marquette County, undergr, Fe
Supt: Gilbert A Dawe
CLIFFS SHAFT, Marquette
County, undergr, Fe
Supt: Onnie Marjama
MATHER MINE, Marquette
County, undergr, Fe
Supt: "A" Shaft: T A Kaupola
Supt: "B" Shaft: A J Andelin
TILDEN MINE, Marquette

County, surface, Fe
Supt: K C Olson
HUMBOLDT MINE, Marquette
County, surface, Fe
Supt: K C Olson
REPUBLIC MINE, Marquette
County, surface, Fe
Supt: E W Lindroos
RESEARCH LAB, Marquette
County, Ishpeming
Ch Mgt: L J Beck
Proj Eng: D K Campbell
PELLETIZING PLANT,
Marquette County
Supt: H W Rembold
ORE IMPROVEMENT PLANT,
Marquette County
Supt: Robert DeGlabriele
(See Minn, Ohio)

GRAND RAPIDS PLASTER
CO
1304 Peoples National Bank
Bldg, Grand Rapids 2
MINE, Gypsum, undergr
open pit

HANNA IRON ORE DIV.
NAT'L STEEL CORP
Iron River

Gen Mgr: R W Whitney
Mgr, Mich Mines: W F Shinnors
Gen Supt: K R Kushinlau
Dist Geol: P W Zimmer
Mech Eng: Warren W Jamar
Elec Eng: Carl N Anderson
Purch Agt: G E Tromblay
CANNON MINE, Stambaugh
undergr, Fe
Mine Supt: G A Koehler
Mine Capt: H Krans, J Bociek
Prod: 2500 tons

HIAWATHA MINE, Iron Riv
undergr, Fe
Mine Supt: J R Quayle
Mine Capt: R Kraus &
A Peterson
Prod: 2,000 tons
HOMER MINE, Iron River
undergr, Fe
Mine Supt: J D McAuliffe
Mine Capt: G Johnson
Prod: 1,500 tons
(See Minn, Ohio, Ozark Ore, Mo)

COPPER RANGE CO
24 Federal St, Boston 10,
Mass
CHAMPION MINE, Painesdale,
undergr, Cu
Gen Mgr: Henry Combelleck
Elec Eng: M Myers
FLOT MILL, Freda
Supt: John Harris
(See Mass & White Pine
Copper Co)

HANNA MNG CO, THE
Iron River
Gen Mgr: R W Whitney
Mgr, Mich Mines: W F Shinnors
Gen Supt, undergr, mines:
K R Kushinlau
Gen Supt, open pit mines:
E W Geist
Dist Geol: P W Zimmer
Mech Eng: Warren W Jamar
Elec Eng: Carl N Anderson
Purch Agt: G E Tromblay
WAUSICA MINE, undergr, Fe
Mine Supt: J D McAuliffe
Mine Capt: W A Lundwall
Prod: 1900 tons
GROVELAND MINE, Randville
open pit, Fe
Mine Supt: P H Lee
Asst Gen Foreman: C Peterson
Prod: 2000 tons
4,000-TON MILL, Randville
Mill Supt: D Smith
(See Minn, Ohio, Ozark Ore
Co, Mo)

INLAND STEEL CO, IRON
ORE OPER

424 S Pine St, Ishpeming
Pres: John F Smith Jr
VP, Raw Mat: Graydon Megan
Treas: W H Lowe
MORRIS & GREENWOOD MINES,
Ishpeming
SHERWOOD MINE, Iron
River
BRISTOL MINE, Crystal Falls,
undergr, Fe
Gen Mgr, Ore Mines:
R D Satterley
Mgr, Ore Mines: P D Pearson
Ch Geol: A T Broderick
Mech Eng: J R Gronseth
Ch Eng: D E Brown
(See Ill, Minn)

INTERNAT'L SALT CO.
INC
Box 311, Scranton 2, Pa

DETROIT MINE, 1841 Sanders
St. Detroit MI
undergr, rock salt
(See La, NY, Pa)

JONES & LAUGHLIN STEEL CORP, MICHIGAN ORE DIV

Negaunee
TRACY MINE, undergr, Fe
Mgr: R W Braund
Supt: R L Balconi
Mech Eng: Michael Kerecman
Elec Eng: John B Mott
Mine Frm: R L Pridemore
Mine Eng: Wm A Benson
(See Minn, NY, Pa)

THE METRO-NITE CO

3523 W Silver Spring Drive
Milwaukee 9, Wisc
MINE, Felch, Dolomite,
undergr, open pit

MICHIGAN CHEMICAL CORP

Saint Louis
Pres: Theodore Marvin
VP: Fred A DeMaistre
Sec-Treas: R J Knapp
Purch Agt: W A Gibbs
Mng Eng: Judeon H Whitman

NORTH RANGE MNG CO

Negaunee
Pres: F P Book
Ch of Bld: R S Archibald
VP: R Archibald
Cons Engr: F J Haller
Sec: E S Holmgren
Treas: Herbert V Book
Ch Elms: G H Peterson
Gen Supt: J C Kirkpatrick
Purch Agt: J M Archibald
BOOK MINE, Alpha
Mill Supt: J E Hayden
CHAMPION MINE, Champion
Supt: R L Sundeen
PENOKEE, Ironwood
Supt: J Zuraw
Capt: Wm Bianchi
(See Minn)

PICKANDS MATHER & COMPANY, (Managing Agts)

700 Sellwood Bldg, Duluth 2
Minn

THE MAUTH MNG CO, GENEVA & NEWPORT MINES, Ironwood, undergr

Supt: A L Johnson
Asst Supt: A J Cignello

FURMAN MNG CO, PETERSON MINE, Bessemer, undergr

Supt: J C Wanguard
Asst Supt: L G Woodworth

SUNDAY LAKE IRON CO SUNDAY LAKE MINE, Wakefield undergr

Supt: R D Hodge
VERONA MNG CO, BUCK
MINE, Caspian, undergr

LAWRENCE MINE, Caspian, undergr

Idle
CORNELL MNG CO, CORNELL
MINE, Iron Min

PALMER MNG CO, VOLUNTEER MINE, Palmer

Supt: C D Bailey
(See Minn, Wisc)

THE QUINCY MNG CO Hancock FLOT MILL, Torch Lake reclamation plant, Cu

Idle

REPUBLIC STEEL CORP

Genl Off: Republic Bldg
Cleveland, Ohio
Dist Off: 307 Sellwood Bldg
Duluth 2, Minn

DIET MFG: S C Howell Ch Mech & Elec Eng: I V Crego ROBIN-COLUMBIA MONONGAHELA MINE, Crystal Falls, undergr, Fe

Mine Supt: E H Anderson
Mine Frm: Emil Johnson
Ch Chem & Ore Grader:
F A Mayheu

WHITE PINE COPPER CO

24 Federal St, Boston 10
Mass
WHITE PINE MINE, White Pine
undergr, Cu
Pres & Gen Mgr: William P
Nichols
Genl Dir: E L Ohio

Met: Virgil L. Lessels
Mech Eng: G F Haberlen
Elec Eng: R W Brunsbeck
Mine Supt: L A Garfield
Mine Flang Engr:
Joe H. Ellenden
15000-TON FLOT MILL,
White Pine
Mill Supt: Ivan T Bowman
Asst Mill Supt: Rose E Gamble
REVERB SMELTER, White
Pine
Supt: Geo D Weaver
(See Copper Range Co & White
Pine Copper Co, Mass)

MINNESOTA

ARCHER-DANIELS- MIDLAND CO

700 Investors Bldg,
Minneapolis, Minn
(See Wyo)

BUTLER BROS (M A Hanna Co, Agents)

Hibbing
Mgr Of Minn Mines:
B M Andreas

MINES, Mesabi Range, Minn, Fe, Mn HARRISON, HALOBE, NORTH HARRISON, QUINN GROUP MINES, Nashauk, Nashauk Twp, Cooley

PATRICK ANN, PATRICK
ANNEX, KEVIN, DAVID,
SNYDER GROUP MINE, Canby
Greenway Twp
WYMAN MINE, Nashauk Twp
AROMAC, OLSON MINES,
HARRISON TAILINGS FORD
"A" MINE
(See Ohio)

CALUMET & HECLA, INC CALUMET DIV

1 Calumet Ave, Calumet
VP & Gen Mgr: A S Kromer
Dir of Purch: W A Barn
Dir, Ind & Pub Rel: H D Stott
ALLOUEZ, CENTENNIAL
NO 2, AHMECK NO 2,
PENINSULA, SENECA,
Calumet, undergr, Cu
Dir, Mng: C A Campbell
Ch Geol: J P Pollock
Proj & Specif Eng Mgr:
P H Outlander

Mech Proj Eng: R B Spencer Elec Proj Eng: A W Mill Construction Proj Eng: T W Knight

Prod: 6,000 tons
6,000-TON GRAY-FLOT MILL,
Dir, Mgr: R K Pouli
CALUMET & HECLA SMELTER
Hubbelt, 5 reverb Cu furnaces
Dir, Smeltg & Ref: E F Farley
Prod: 80,000 lbs Cu yrly
OSCEOLA NO 6 MINE & NO 13
Calumet, undergr, Cu
Under devel

CENTENNIAL NO 1 MINE Calumet, undergr Explor CALEDONIA MINE, Greenland undergr, Cu Idle (See Ill, N Mex, NY)

CLEVELAND-CLIFFS
IRON CO, ORE MNG
DEPT

1460 Union Commerce Bldg
Cleveland 14, Ohio
Chrm-Pres: Walter A Sterling
Exec VP: H S Harrison
VP, Mng: James S Westwater
Sec: Robert M Kimmel
Treas: J P Long

MINNESOTA OPER, 2031 E 2nd
Ave, Hibbing
Mgr, Minn Mines: J J Foucault
HAWKINS MINES, Nashauk
Surface
WASH PLANT, H M S PLANT
Supt: William LeClair
HILL-TRUMBLE MINE, Marble
open pit
WASH & H M S PLANT, Calumet
Supt: M L Viant
HOLMAN-CLIFFS MINE,
Coleraine, open pit
WASH & H M S PLANTS
Coleraine
Supt: E Hill
CANISTEO MINE, Coleraine,
open pit, wash & H M S Plant
Supt: Ronald Pearson
(See Mich, Ohio)

COONS PACIFIC CO

Box 27, Ewelath
Pres: H H Harrison
Supt: R B Hard
CUSTOM IRON ORE CONCEN
8,000 TON GRAY-HEAVY
MEDIA MILL, Ewelath
(See Pacific Islr Mng CO)

DOUGLAS MINING CO

Hibbing (M A Hanna Co,
Agents)
Mgr of Minn Mines:
B M Andreas

Asst Gen Mgr: R C Wallace Ch Eng: R O Buck MINES, Mesabi Range, Fe DOUGLAS, DUNCAN GROUP MINE, Balkan Twp (See Ohio)

ERIE MNG CO (Managed by PICKANDS MATHER & CO)

Hoyt Lakes
(Owned by: Youngstown Sheet &
Tube Co: Interlake Iron Co;
Steel Company of Canada Ltd;
Bethlehem Steel Co)

CRUSHING, CONCENTRATING & PELLETIZING PLANT, open pit, Taconite Wm Mgr: L E Johnson Asst Wm Mgr, Service J H Hooley & B F Bergel Supt, Ore Dress: H P Whaley Supt, Agglomerating K R Groll Supt, Mng: H F Sears Supt, Railrd & Harbor: P F Gieseking Supt, Power Plant: R E Peck Supt, Maintenance: B D Hall (See Pickands Mather & Co, Mich, Minn, Wisc)

HALEY-YOUNG MNG CO

2223 First Ave, Hibbing
Pres: E A Young
Sec-Treas: David D Haley
ELBERN MINE, 2 mi SE of
Fraser, surface, Fe
Supt: Leo Cashen
Frm: Michael Malik
(See Young, E A, Inc, Minn)

HANNA IRON ORE DIV. NAT'L STEEL CORP

Box 120, Hibbing
MINES, Cuyuna Range, Fe, Mn
PORTSMOUTH GROUP
ROBERT MINE, Cuyuna
MINES, Mesabi Range, Fe
HUMMER MINE, Mesabi Range
(See Mich, Ohio)

THE HANNA MNG CO (Formerly Hanna Coal & Ore Co)

3125 3rd Ave E, Hibbing
Mgr, Minn Mines:
B M Andreas

Asst Mgr, Minn Mines: R C Wallace Gen Supt: Mesabi Range: F E Dyson Gen Supt, Cuyuna Range: G B Hunter Supt, Cooley Grp, Nashauk: L Claver Supt, Miss Grp, Keweenaw: R M Gross Supt, Buckeye Grp, Coleraine: A G Nelson Supt, Pierce Grp, Weggum Mine, Hibbing: H A Brydeld Supt, S Agaw Grp, Hibbing: R E Thompson Supt, Douglas Grp, Chisholm: L T Kreis Supt, Enterprise Mine, Virginia: E C Johnson Supt, Pillsbury Co Mines, Spring Valley: C A Pedersen Chief Eng, Hibbing: R O Buck Asst Chf Eng, Hibbing: C J Melli Asst Chf Eng, Nashauk: H A Larson Asst Chf Eng, Crosby: R E Jackson Clms Mgr, Hibbing: G A Borgeson Dir of Beneficiation, Nashauk: S E Erickson

MINES, Mesabi Range, Fe
ARGONNE LEACH, CARLE #2
EAST ALPENA, HUNT, PERRY
MINES, Cuyuna Range,
ALSTEAD, 2 ALSTEAD, ARKO,
N HILLCREST & EXTENSION,
S HILLCREST, HUNTINGTON,
FEIGH, MARCO, MUSBER
MINES, Pillsbury & Mower
County Q BAKER, N BLY,
M BONNERUD, O BORNFLETH

O BREHMER, W & L BYRGE,
M COOPER, R COPEMAN,
N FEINSTERMACH, W
FREEMAN, N GRANTUM, K
HARNER, H V HASLAM, J M
HEBIG, G KARPERS, A KUMM,
W LEE, H M LONG, C
MANDELKO, W MENSINK,
G MEYER, O MEYER,
K OLSON, T OLSON, OSTERUD
& DUNCANSON, B PEARCE,
J PRINSEN, F RUSSEK, G
SCHMIDT, G TART, H & C
THORSON, B O THORSON,
R WINTER
(See Mich, Ohio & Osgard Ore
Co, Mo)

HANNA ORE MINING CO (M A HANNA AGENTS)

Hibbing
Mgr of Minn Mines:
B M Andreas

MINES, Mesabi Range, Fe BRAY, GORDON, MESABI CHIEF, MES #3, Nashauk Twp Keweenaw, BRUNT MINE, IMPRO RESERVE, NORPAC MINE, NORTH UNO MINE, ROY MINE, WEST ALPENA ENTERPRISE MINE, Virginia PIERCE GROUP, Hibbing (See Ohio)

INLAND STEEL CO, IRON ORE OPER

Chicago, Ill
ARMOUR NO 2 MINE, Ironton,
undergr, Fe
Gen Mgr: R D Satterley
Mgr: P D Pearson
Mine Supt: L S Olson
Mine Frm: H Nyberg
Mine Engr: D Piroop
Prod: 1,000 tons
(See Ill, Mich)

JESSIE H MNG CO

Box 466, Grand Rapids
Pres: E W Baiter
VP: R N McGiffert
JESSIE MINE, 2 mi E of Grand
Rapids, open pit, Fe
Mine Supt: L R Sevall
Mine Frm: Art Anderson
Mine Engr: J J Walker
Prod: 1,400 tons
2,000-TON MILL, 3 mi E of
Grand Rapids

JONES & LAUGHLIN STEEL CORP, MINN ORE DIV

Virginia
Mgr: H F Kullberg
Asst Mgr: R E Durocher
Western Dist Supt: J F Linden
Eastern Dist Supt: F W Kruse
Supt of Maint: D Madich
Ch Acct: T A Parish
Res Eng: A F Gaspar
Res Geol: T E Stephenson
Ch Mng Eng: C H Grant
Ch Ore Dressing Eng:
R W Livingston
Super, Pers Rel:
C E Dickens
Mine Ind Eng: L E Hodli
MINES, Mesabi Range, surface
Fe
HILL ANNEX MINE, MILL &
TAILINGS RECLAMATION
PLANT, Calumet
Mine Supt: W Ball
Mill Frm: R L Abercrombie
LONGYEAR MILL & MINE,
Hibbing
Dist Supt: J F Linden
Mine Supt: J Srande
Mill Frm: G D Sarff
LIND-GREENWAY MINE,
Coleraine
Dist Supt: J F Linden
Mine Supt: A C Seaberg
Under devel
COLUMBIA MINE & MILL,
Virginia
Dist Supt: F W Kruse
SCHLEY-PETIT MINE & MILL,
Gilbert
Dist Supt: F W Kruse
(See Mich, NY, Pa)

LITHIUM CORP OF AMERICA INC

1100 Title Ins Bldg
Minneapolis, Minn
Pres: Herbert W Rogers
Exec VP-Treas:
Harvey D Feltschstein, Jr
Sec: Richard A Hughes
Purch Agt: John W Douglas
Asst: Fred Dixon
(See N C, S D)

MANGANESE CHEMICAL CORP

Rand Tower, Minneapolis 3
Minn
PLANT, Riverston

W S MOORE CO

408 Torrey Bldg, Duluth
Pres: W S Moore
Sec: H A Nelson
Geol: J V Everett
RANGE OFFICE, 415 W Grant
St, Hibbing
Gen Mgr: H E Reese
Ch Eng: J M Macdonald
Mech Supt: H F Arnold
Gen Plant Frm: W Kinnamen
Office Mgr: R J Kennedy
JUDSON MINE, 1 mi S of Dahl
surface, Fe
JUDSON CRUSHING &
SCREENING PLANT
MARISA MINE, 1 mi NE of
Gilbert, surface, Fe
HEAVY MEDIA
CONCENTRATOR ALICE,
NORMAN & YAWKEY
MINES, Surface, Fe

MORTON ORE CO (M A HANNA CO, AGENTS)

Hibbing
Mgr of Minn Mines:
B M Andreas

MINES, Mesabi Range, Fe MORTON, SOUTH EDDY GROUP MINE, Stunts Twp, CAMPBELL "D" Mine Mine Frm-Mine Supt: R E Thompson

NORTH RANGE MNG CO

Negaunee, Mich
LEONIDAS MINE, Ewelath
Supt: Hugh Clark
Capt: Leonard Erickson
ZENITH MINE, Ely City
Supt: R L Mitchell
Capt: H C Clark
(See Mich)

OGLEBAY MORTON & CO

1300 Hanna Bldg
PO Box 6508, Cleveland, Ohio
NORTHERN OFFICE, 200
Casside Bldg, Duluth 2
Mng Eng: A F Terrano
ST JAMES MINING CO, Aurora
Mgr: Oglebay Morton & Co
ST JAMES MINE, Aurora,
surface, Fe
Supt: B L Knudsen
Asst Supt: T E Trlthy
Master Mech: Walter Williams
Ch Elec: Edward M Platner
(See Ohio, Wisc)

PACIFIC ISLE MNG CO

2521 First Ave, Hibbing
Pres: Hugh H Harrison
Asst to Pres: D J Keeler
VP & Gen Supt: A E Tuomala
VP, Proj & Engr: Harry M
Hart, Jr
VP: C B Jacobs
Sec: John Mulvihill
Treas & Ofc Mgr: Ian P S
Pearson
Dir, Tech Serv: Edward P
Edam
Dir, Benefic: Donald C
Kimball
Svpr-Safe & Secur: Wob
McCulley
Ch Ore Grader: I F Akin
Gen Supt: Arne O Tuomala
Ch Eng: A J Vellella
INCLUDES CHATACO MINING
COMPANY, COONS PACIFIC
COMPANY, HOLLAND MINING
COMPANY, PITTSBURGH
PACIFIC COMPANY
MINES, CHATACO, CROXTON-
STYME, FOWLER-MEADOW,
GRAHAM-WENTWORTH
HOGUOIS, JULIA-COMMODORE
PLANTS: NORTH UNO CONCEN
Plant Superv: Jack Dubam
COONS PACIFIC CONCEN
Plant Superv: Ralph Hurd
VIRGINIA CONCEN
Plant Superv: Earl Saari
JULIA WASHING PLANT
MANUEL WASHING PLANT
ST PAUL WASHING PLANT
(See Michigan & Pittsburgh
Pacific Co, Zontelli Div, Minn)

PICKANDS MATHER & CO

700 Sellwood Bldg, Duluth 2
Mass
Asso Gen Mgr: D M Chisholm
Mgr of Eng: G L Vauch
Ch Mech-Elec Eng: W N Thomas
Purch Agt: D A Brunson
Svpr of Safety & Ind Rel:

E A Andrusen
Asst Gen Mgr, open pit oper:
T C Thielman
Adm Asst, open pit oper:
Bruce Stunkard
Asst Gen Mgr, undergr oper:
F R Werther
Adm Asst, undergr oper:
W E Seppanen
ERIE MNG CO, Hoyt Lakes
Taconite
Works Mgr: L E Johnston
LAKE MNG CO, EMBARRASS
MINE, Biwabik
Supt: W L Thome
CORSICA IRON CO, CORSICA
MINE, McKinley, Beneficiating
MINE
CRETE MNG CO, ALBANY
MINE & WASHING PLANT,
Hibbing, undergr
MINE
HOYT MNG CO, SCRANTON
MINE, CRUSHING & WASHING
PLANT, Hibbing, surface
Supt: T R Tregembo
MAHONING ORE & STEEL CO,
MAHONING MINE, Hibbing
Beneficiating, surface
Supt: W D Webb
UTICA MNG CO, WADE MINE,
Buhl
MINE
UTICA MNG CO, CARNI-
CAMBON LAKE MINE &
CRUSHING PLANT, Hibbing
surface
Supt: E R Tyler
MINE
BENNETT MNG CO, BENNETT
MINE, Keewatin, Beneficiating
Supt: E R Tyler
BALKAN MNG CO, DANUBE
MINE & BENEFICIATION
PLANT, Bovey, surface
Supt: L M Becker
WESTERN MNG CO, WEST
HILL MINE & BENEFICIATION
PLANT, Grand Rapids, surface
Supt: R T Bell
MINE
WESTERN MNG CO, TIOGA #2
MINE, Grand Rapids, surface,
beneficiating
Supt: R T Bell
CUYUNA ORE CO, MAHNOMEN
MINE, Ironton, surface
Supt: H J Stetson
YOUNGSTOWN MINES CORP,
RABBIT LAKE MINE, Cuyuna
surface
Supt: H J Stetson
(See Mich, Wisc)
PIONEER MNG CO
Box W, Biwabik
Pres: Frank S Bergstrom
Ch of Bd: Patrick Butler
Sec: F J McArthur
Treas: R J Floeder
MARY ELLEN MINE, 1/2 mi W
of Biwabik, open pit, Fe
Mine Frm: Frank Press Jr
Mine Engr: W T Henderson
6000-TON-HEAV-MED MILL,
at mine
**PITTSBURGH PACIFIC
CO**
Crosby
Chmn of Bd: Hugh H Harrison
Pres: E T Binger
Asst to Pres: Donald J Keeler
VP-Sec: N E Hill
Treas: A J Kugel
Mng Engr: Elton La Sart
Elec Engr: Dan Doshan
Dir, Min Devel:
G T Beardshear
VIRGINIA MINE, N of Ironton,
Cuyuna Range, surface, Fe
4,000-TON VIRGINIA PLANT
TROMMALS
MINNESOTA MINES
MANGAN-JOAN MINE,
Irondale, Cuyuna Range,
surface, Fe
MERRITT LEAN ORE
STOCKPILE, Trommald,
Cuyuna Range
MANUEL AIRPORT MINE,
Crosby, Cuyuna Range,
surface, Fe
SAGAMORE MINE, Riverton,
Mo, Fe
Prod: 1800 GT
2,500-TON MANUEL PLANT,
Crosby
(See Pacific Isle Mng Co,
Minn)
REPUBLIC STEEL CORP
Gen Off: Republic Bldg,
Cleveland, Ohio
Dist Off: 207 Sellwood Bldg

Duluth 1
Dist Mgr: S C Howell
Ch Mech & Elec Engr: V Crego
SHIBUHANNAN MINE, Hibbing
open pit
Supt: S V Smith, Jr
(See Ala, Mich, N Y, Ohio)
RESERVE MNG CO
Silver Bay
Exec VP: R J Linney
VP-Treas: J Wm Bryant
Sect: J J Dwyer
Mgr, Silver Bay Div: E C
Langman
Purch Agt: E K Smith
Dir of Ind Rel: W L Edwards
Dir of Public Rel:
Edward Schmid
Supt, Pelletizing: K M Haley
Gen Frmt: John F Janowski
Supt, Crushing & Concen:
E M Purvess
Mgr, Babbitt Div: M O Woodie
Supt, Mech Maint Dept: C D
Frieblich
PETER MITCHELL MINE,
Babbitt, open pit, Iron pellets
from taconite rock
Mine Supt: F E McIntire
E W DAVIS WORKS, Silver
Bay, Magnetic separation
RHODE & FRYBERGER
Box 778, Hibbing
Part: J O Rhode
TROY MINE, Eveleth, Mesabi
Range, open pit, Fe, H M S &
JNG PLANT
BOEING MINE, Hibbing, Mesabi
Range, open pit, Fe, Wash Fl
BROWN MINE, Ironton
Cuyuna Range, undergr, Fe
CARLSON-NELSON MINE,
Cuyuna Range, open pit, Fe
PEARSALL MINE, Mesabi
Range, open pit
H M S & JNG PLANT
ST JAMES MNG CO
ST JAMES MINE, Aurora, open
pit, Fe
Gen Supt: B L Knudson
Asst Supt: T E Trehey
Master Mech: W Williams
Ch Elec: Ed Plattner
(See Oglebay Norton Co)
SCHROEDER MNG CO
PO Box 487, Chatfield
Pres: F E Schroeder
VP: J R Ritchay
KRUGER MINE, near Chat-
field, Fillmore Co, Fe
SKUBIC BROS CO
705 6th Ave N, Virginia
Pres & Treas: Frank Skubic
VP & Purch Agt: Edward Skubic
VIRGINIA MINE, Eveleth, 1 mi
S, surface, Fe
Gen Supt: Edward Skubic
Gen Mgr: Frank Skubic
Elec Engr: Karl Sulentic
Master Mech: C Larry Dahl
12000-TON-HEAV-MED, at
mine, Jig, Spirals-Magnetic Sep
Mill Supt: Karl Sulentic
SNYDER MNG CO
101 Alworth Bldg, Duluth 2
Pres: Wm F Snyder, Jr
VP & Gen Mgr: Fayette Brown
Jr
Sec: W Laird Davis
Treas: John K Foster
Gen Supt: C O Rudstrom
Ch Engr: Rudolph Ekas
Ch Chem: A W Johnson
Mech Supt: Wayne Meadows
Mech Asst: Max Hoag
Comptroller: V O Youngdahl
Purch Agt: Stanley J Hill
Supvr, Mobile Ept: O E Larsen
Gen Maint Frm: Joe Zoltis
WEBB MINE, Hibbing, open pit
Fe
Mine Supt: T J Barker
Gen Mine Frm: J J Munter
Res Engr: Edward Zoltis
2800-TON WASHING PLANT
Master Mech: Dick Costanzi
WHITESIDE MINE, Buhl, open
pit, Fe
Mine Supt: T J Barker
Gen Mine Frm: Albert Stukal
Res Engr: M J Boblich
Master Mech: F C Dodge
2,800-TON GRAV-MILL, at
mine
GODFREY MINE, Chisholm
undergr, Fe
Mine Supt: O A Axelsson
Mine Engr: K P Con
Master Mech: J V Vidmar
(See Pa)

SOUTH AGNEW MNG CO
(M A Hansen Co, Agents)
Hibbing
Mgr of Minn Mines:
E M Andreas
MINES, Mesabi Range, Fe
SOUTH AGNEW, AGNEW NO 3
GROUP MINE, Stuntz Twp
Mine Supt: R E Thompson
(See Ohio)
U S STEEL CORP.
OLIVER IRON MNG DIV
Wolvin Bldg, Duluth 2
Exec VP: W N Matheson
Asst to VP: L S Campbell,
W E Cotter, Jr
VP-Admin: R O Hawkanson
Gen Att & Asst Sec-US:
F B Stevens
Att & Asst Sec-US:
H P Clarke
Asst Sec: T O Archer
Treas: R B Davenport
Comptroller: R D Ryan
Asst Comptroller: G T Bethune
Dir Mineral Dev: H A Moberg
Staff Asst to Dir Mineral Dev:
S V Bradley
Mgr Min Engr: A H Axelsson
Mgr Geol Investigation:
R W Maraden
Mgr Beneficiation: A T Koenen
Asst to Mgr Beneficiation:
K F MacAlpine
Mgr Research: R J Morton
Asst Mgr Research: R L
Bennett
Mgr Ind Engr: Q T Martin
Ch Engr: C N Bailey
Asst Ch Engr: C R Burton
Dir Ind Rel: J S Bonte
Supv Ore Movement: F J Perry
Mgr Safety & Compensation:
R F Wilson
Mgr Personnel: D V Dodge
Ch Grader: G H Sharbach
Asst Ch Grader: M H Hall,
R L Hawkanson
Purch Agt: L L Slabodnik
Asst Purch Agt: D L Cudmore
EASTERN DISTRICT, VIRGINIA
Gen Supt: John Chisholm
Asst Gen Supt: M V Mielke
Supt Maint: J A Vitthum
Asst Supt Maint: J D Pardon
(Mech), C R Peterson (Elec)
W A Hyde (Pilotac)
Ch Mng Engr: B Scipioni
Asst Ch Mng Engr: D N Hill
Ch Chem: I R Lerohl
Asst Ch Chem: J M Martin Jr
ROUCHLEAU MINE, Mesabi
Range, surface, Fe
Supt: D Hartley
Asst Supt: D B Muckler
PILOTAC MINE, Mesabi
Range, surface, Fe
Supt: I H Rubov
STEPHENS MINE, Mesabi
Range, surface, Fe
Supt: E V Nelson
Asst Supt: E J Olson
PIONEER MINE, Vermilion
Range, undergr, Fe
Supt: L E Dick
Asst Supt: J D Warner
SOUDAN MINE, Vermilion
Range, undergr, Fe
Supt: E M Holman
**ROUCHLEAU SIZING &
EXTACA PLANTS**
Supt: C W Nieri
Asst Supt: D V Erickson
PILOTAC PLANT
Supt: W A Arpi
WESTERN DISTRICT, Hibbing
Gen Supt: J H Hearing, Jr
Asst Gen Supt: M E Johnson
Dir: Supt: N G Holland,
E A Friedman
Supt Maint: J R Schoenig
Asst Supt Maint: R N McIndoo,
W L Prothro
Ch Mng Engr: M R Serron
Asst Ch Mng Engr: L E Battles,
R R Wallace
Ch Chem: W E Holliday
Asst Ch Chem: L A Danielson
M O Carlson
HULL-RUST MINE, Mesabi
Range, surface, Fe
Supt: E C Silver
Asst Supt: T C Oliver
SHERMAN MINE GROUP,
Mesabi Range, surface, Fe
Supt: M J Foreman
Asst Supt: M D Vandelin
SHERMAN SIZING PLANT,
Mesabi Range, surface, Fe
Supt: W W Beebe
MONROE MINE, Mesabi Range
surface, Fe
Supt: W J McGuire

Asst Supt: E M Gilmore
**ARCTURUS MINE & CONCEN-
TRATOR**, Mesabi Range,
surface, Fe
Supt: N F Bolton
**FLUMMER MINE & CONCEN-
TRATOR**, Mesabi Range,
surface, Fe
Supt: A F Savage
Asst Supt: F J Hitchcock
(Plummer Mine) W L Zeiber,
(Concentrator)
**WALKER & KING MINE &
TROUT LAKE CONCENTRATOR**
Mesabi Range, surface, Fe
Supt: J H Harrison
Asst Supt: L Scipioni (Walker
& King Mines)
V V Ahola (Concentrator)
(See Alaska, Ala, Calif, Mo,
Tenn, Utah, Wyo)
YOUNG, E A INC
2223 First Ave, Hibbing
Pres: E A Young
VP & Supt: Nels Kempainen
Sect: D D Haley
MINNEWAS MINE, PO Box 116,
Virginia, 2 mi E of Virginia
Mesabi Range, surface &
undergr, Fe
Frm: A N Heikkila
(See Haley-Young Mng Co, Minn)
MISSISSIPPI
AMERICAN COLLOID CO
8550 Safford Court
Shakopee, Ill
ABERDEEN MINE, surface,
bentonite, Aberdeen
Supt: Edward G Birkholz
ABERDEEN MILL
Cap: 250 tons
WHITE SPRINGS MINE,
surface, bentonite, White
Springs (P O at Aberdeen)
Supt: Edward G Birkholz
(See Ill, S D, Wyo)
FILTROL CORP
Smithville
MINE, open pit, Smith Co Mine
bentonite
Supt: Charles Cantrell
**INTERNAT'L MINERALS
& CHEMICAL CORP**
Smithville (P O Amory)
Mgr: C M Clay
Supt: J Flowers
SOUTHERN BENTONITE MINE,
Open pit
(See Ariz, Fla, Ill, Maine, N Mex
N C, S D, Tenn, Va, Wyo)
**KENTUCKY-TENNESSEE
CLAY CO**
Mayfield
MINE, Crenshaw
Supt: Gardner Wilke
**MAGNET COVE BARIUM
CORP**
Knoxville
MINE, Open pit
(See Fla, Mo, Nev, Tex, Wyo)
**URANIUM VENTURES,
INC**
1206 Deposit Guaranty
Bank Bldg, Jackson
MINE, San Juan Co, Utah,
Uyo
(See Utah)
**WYANDOTTE CHEMICALS
CORP**
Blue Mountain
MINE, open pit
Supt: E G Andrews
**AMERICAN ZINC, LEAD
& SMELTING CO**
1515 Paul Brown Bldg, St
Louis
Pres: H I Young
VP: R A Young
VP & Treas: W J Matthews, Jr
VP & Controller: C V Burns

Sect: R C Perkins
Purch Agt: E K Minear
Mgr Mng Oper: R E Calhoun
Dir Milg & Min Benef:
H Ammon
(See Ariz, Ill, Ohio, Oia, Tenn,
Tex, Utah, Wash, Wisc &
Joint Oper, with Peru Mng Co,
N Mex)
APEX MNG CO
Box 318, Mineral Point
MINES, Washington Co, open
pit, Ba
BURLESON & STEWART
HOCOMO MINE, Howell Co,
open pit, Fe
C & W POLITE MNG CO
Cader
MINE, Washington County, open
pit, barite
CENTRAL MNG CO
332 Vine St, Poplar Bluff
MINE, Wayne Co, open pit, Fe
COMET MNG CO
Route 13, Box 884,
Springfield 2
Mng Engr: Robert E Crowder
COMMERCE MNG CO
509 Olive St, St Louis 1
Free & Treas: G H Fox
VP: J W Meyer
Sec: D H Fox
(See Colo)
**FEDERAL MNG &
SMELTING CO**
(Wholly-owned subd of
Amer Smelting & Refining Co)
DUTENWEG MINE, Jasper,
Pa, Zn
MINE
GENERAL BARITE CO
DeSoto
MINES, Washington Co, open
pit, Ba
H & F MNG CO
605 Valley Rd, Potosi
MINES, Washington Co, open
pit, Ba
HOLLY MNG CO
Potosi
MINE, Washington Co, open
pit, Ba
HORNSEY BROS CO
Potosi
Pres: F Hornsey
MINE, Washington Co, open
pit, Ba
**HOWARD CONSTRUCTION
CO**
West Plains
MINE, Howell Co, open pit, Fe
**MAGNET COVE BARIUM
CORP**
Potosi
MINE, Potosi, open pit, barium
Plant Mgr: George L Carter
Asst Plant Mgr: Floyd H Carter
WASHING PLANT, at mine
Supt: B J DeClue
250-TON MILL, at mine
Supt: Russell Degonia
(See Fla, Miss, Nev, Tex Wyo)
MERAMAC MNG CO
Pea Ridge
Res Mgr: Earl Buhsimer
MINE, near Potosi, Fe
Under devel
MIDWEST MNG CO
Box 87, Potosi
MINE, Washington Co, open
pit, Ba
MILLER & REYNOLDS
Keokuhong
WATSON MINE, Oregon Co,
open pit, Fe
**MILWHITE MUD SALES
CO**
3920 Essex Lane, Houston 27
Texas
HOWELL, PALMER MINES,
Belgrade, Washington County,
Barite
SUN MINE, WHALEY SCOTT
MINE, Washington County,
Barite
MINE LA MOTTE CORP
250 Park Ave, N Y 17, N Y
MINE LA MOTTE, undergr,
surface, Fe, Bonne Terre
Div Mgr: E A Jones

Idle
3,000-TON FLOT-GRAY MILL,
Fredericktown
(See N Y)

MINERVA OIL CO
330 N 4th St, St. Louis 2
Pres-Treas: Joe Denlog
VP: Joe Denlog, Jr.
CHL Montgomery
Sec: Berkley Jones
(See Ill)

MONSANTO CHEM CO
800 N Lindbergh Blvd
St. Louis 48
Pres: Charles Allen Thomas
Exec VP: C H Commer, Jr.
INORGANIC CHEM DIV
Dir of Mng: G Donald Emigh
Gen Mgr: J L Christian
Asst Gen Mgr: E J Bock
T K Smith, Jr.
Exec Admin: H F Weaver
Dir, Phos Manuf: H O Tittle
Dir, Devel: J J Burbage
Dir, Research: E O Somogyi
Dir, Engng: J M Depp
Dir, Raw Mat & Traff
E G Thomas
(See Idaho, Tenn)

**NATIONAL LEAD CO,
BAROID DIVISION**
FOUNTAIN FARM, Pototsi
surface, barite
DRY GRIND MILL
Supt: E L H Sackett
(See Ark, Calif, Colo, Kans,
La, Mont, Nev, N Y, Tenn, Tex
Wyo)

**NATIONAL LEAD CO,
ST LOUIS SMELTING &
REFINING DIV**
Box 351, Fredericktown
Gen Mgr: O D Niedermeyer
Mgr: Harold A Krueger
MADISON MINES, Fredericktown,
undergr, Pb, Cu, Ni, Co
Gen Supt: J E Phobus
Mine Supt: F H Hurst
Geol: R P Uhley
Met: L W Traub
Elec Eng: R W Slavens
1,450-TON FLOT MILL
Mill Supt: G F Coops
Asst Mill Supt: Omega Moreland
REFINERY, Fredericktown
Mgr: W R McCormick
Supt: G E Peters
Under devel
(See Ark, Calif, Colo, La, Mont,
Nev, N Y, Tenn, Tex, Wyo)

OZARK ORE CO
Iron Mountain
IRON MOUNTAIN MINE,
undergr, iron ore
Gen Supt: R F Matson
Purch Agt: A W Janke &
John Hagen
Geol: John Murphy
Mine Frm: Byron Miller
Mine Eng: R Pillard
Master Mech: Henry Gratton
Chief Elec Vic: Calliste
3,000-TON FLOT-GRAY MILL
Mill Supt: Lloyd Erpenbach
Mill Frm: Lee Williams,
Luther Williams
Assay: R E Key
(See M A Hanna Co & Ozark Ore,
Ohio)

PATTERSON MNG CO
727 Missouri Ave, West
Plains
MINE, Howell County, open
pit, Fe

**PLATEAU IRON ORE
CORP**
PO Box 39, West Plains
BANDERS & BALL MINE,
West Plains, Oregon County,
open pit, Fe
Gen Mgr: Roy Pledger
Asst Gen Mgr: Frank Weldon
Gen Supt: H J Thompson
Elec Eng: A C Strickland
Mine Supt: Frank Weldon
(Banders) H J Thompson
(Ball)

**500-TON HEAVY MEDIA
MILL, At Ball mine**
(See Ind)

**POTTER SIMS MINES
INC**
Box 329, Joplin
Pres: Geo W Potter
VP-Sec-Treas: D S Sims
Gen Supt: Leonard Parker

Mine Frm: Geo T Brown
BUCKEN FLAT MINE, Webb
City
WESTSIDE MINE, 1 1/2 mi S of
Albia, open pit, Pb, Zn
3500-TON FLOT-GRAY MILL,
Webb City
Idle

RIPLEY CO MNG CO
332 Vine St, Poplar Bluff
MINE, Ripley Co, open pit, Fe

ST JOSEPH LEAD CO
280 Park Ave, N Y 17, N Y
SOUTHEAST MISSOURI MNG
& MLG DIV, Box 33, Bonne
Terre, undergr, Pb, Zn
Dir Mgr: Elmer A Jones
Asst Div Mgr: L E Cantel
Ch Geol: John S Brown
Gen Mech Supt: B L Beal
Div Supt, Indian Cr Mine &
Miller K R Baker
Gen Mill Supt: T J Clifford
Gen Mine Supt: L L Turley
Asst Gen Mine Supt: C B Davis,
B T Wyckoff
Prod: 13000 tons per day

4-FLOT-GRAY MILLS
Mill Supt: H A Hoffman,
H R Stahl, K B Hall
Asst Mill Supt: E J Krokoska
Capt: 13000 tons
BLAST FURNACE,
Mercurium
Dir Mgr: John W Sherman
Capt: 100,000 tons lead yrly
VIRBURNUM MINE, Crawford,
Iron & Washington County, Pb
Under devel
(See N Y, Pa)

**SHOOK & FLETCHER
SUPPLY CO**
West Plains
KINGSBURY MINE, Howell
County, MELTON MINE,
Shannon County, open pit, Fe
Gen Mgr: E H Craddock
Mine Supt: Robert Wilson
(See Ala)

STEPHENS MNG CO
2nd & Jefferson St,
West Plains
Own: Carroll J Stephens
MINE, 6 mi W of West Plains,
open pit, Fe
Prod: 50 tons
75-TON-LOG WASHER, at mine

TASKEE MNG CO
332 Vine St, Poplar Bluff
MINE, Wayne Co, open pit, Fe

TERRACE MNG CO
Box 128, Pototsi
Pres & Treas: F W Floyd
VP: G H Groves
Sec: Robert D Evans
MINE, open pit, barite
Mine Frm: H D Henry
50-TON GRAV MILL, 2 mi
N of Pototsi, barite
Mill Frm: H D Henry

U S GYPSUM CO
300 W Adams St, Chicago 6
Illinois
MINE, Farnams, open pit,
limestone
Works Mgr: E E Long
(See Calif, Colo, Conn, Ill, Ind,
Iowa, Okla, S D, Tex, Utah, Va)

WAYNE CO MNG CO
332 Vine St, Poplar Bluff
MINE, Wayne Co, open pit, Fe

WOOD, A W
Vails Mines
MINE, Jefferson Co, open pit,
Ba

MONTANA

ABBOTT, GRANVILLE S
Lewistown
BLACK BULL MINE, Lewistown
Fergus Co, undergr, open pit,
Au, Ag, Cu, Pb, Zn
Prod: 10 tons

AMAZON MNG CO
Box 372, Couer d'Alene
Idaho
Pres: A E Lundon
Sec-Treas: Geo M Servick

MINE, near Heron, Au, Ag, Cu
Mont Agt: Joe Brooks, Moscow
Under devel
(See Idaho)

**AMERICAN CHEMET
CORP**
East Helena
RUBY MINE, Madison Co, Talc

AMERICAN CHROME CO
1 Montgomery St
San Francisco 4, California
MOUAT MINE, Nye, undergr,
chrome conc
Geol: E S Rugg
Prod: 1,000 tons
1,000-TON GRAV MILL, Nye
Table concentration
(See Calif)

**ANACONDA ALUMINUM
CO**
Columbia Falls
AL REDUCTION PLANT,
Columbia Falls
Prod: 80,000 tons
Asst Gen Supt: E O Wester
(See Ky)

**AMERICAN SMELTING &
REFINING CO**
JACK WAITE MINE, Sanders
County, Pb, Zn
Supt: C H Blackwell
EAST HELENA PLANT, East
Helena, Custom Lead Smelter
Mgr: S M Lane
Supt: K D Loughridge
(See Ariz, Calif, Colo, Idaho,
Ill, Md, Nebr, N J, N Mex, N Y,
Tex, Utah, Wash & Federal
Mng & Smelting Co, Mo)

ANACONDA CO, THE
Butte
VP, Chg West Oper:
E I Renouard
Gen West Counsel:
W M Kirkpatrick
Asst to VP: J H Dickey, Jr.
Asst VP: E D Tierney
Pers Mgr, West Oper:
John C Kearns
Asst Sec-Treas: D R Nelson
Mgr of Mines: Martin K
Hannifin
Gen Supt of Mines: A R Sims
Ch Geol, Mont Div: E P Shea
Geol, Butte Mines:
C C Goddard, Jr.
Ch Mng Eng: F W Strandberg
Ch Sampler: P K Ramsey
Dir, Mng Research:
Richard M Stewart
Ch Research: R L F Bishop
Ch Mech, Elec Eng:
C J Lundborg
Mech Supt: George Lilly
Ch Draftsman: Marcus McCanna
Asst Mech Supt: Paul M Young,
Frank Ralph
Elec Supt: Merton Callow
Chmn of Bureau of Safety:
H A Wendel
Ch Ventilation-Industrial
Hygiene Eng: J H Warren
West Oper Agt: F W Switzer
Labor Bureau, Cln Dept:
Eugen Hogan, Mgr.
V J Kyllingslad, Asst Mgr
Dist Traf Mgr: W L Kennedy
Ch Assayer: W C Gallagher, Jr.
Supt, Janhoe Sampler:
Dennis E Leary
Frm, Precipitation Pitt:
J P Ryan
Layout Eng: R P Corbett
Pit Supt: G W Parker
Pit Frm: E E Norris
Mng Eng, Pit Oper:
John F Dougherty
ALICE PIT, Butte Dist, Zn
Asst Gen Supt: E O Bonner
ANSELMO MINE, Butte Dist
Zn, undergr
Asst Gen Supt: V D O'Leary
Mine Supt: Sam Heatherley
BELMONT, MINE, Butte Dist,
undergr, Cu
Asst Gen Supt: H M Strook
Mine Frm: John Kileear
BERKELEY PIT, Butte Dist
open pit, Cu
Asst Gen Supt: E O Bonner
Supt: G W Parker
Frm: E E Norris
Mng Eng: J J Dougherty
EMMA MINE, Butte Dist
undergr, Mn, Zn
Asst Gen Supt: J R C Russell
HIGH ORE MINE, Butte dist
Asst Gen Supt: E O Bonner
Frm: J J Canavan
KELLEY MINE, Greater Butte

Proj, Butte dist, Cu
Asst Gen Supt: V D O'Leary
Mine Supt: John Killooy
LEONARD MINE, Butte dist,
undergr, Cu
Asst Gen Supt: H M Strook
Mine Supt: Russell Powell
LEKINGTON MINE, Butte Dist
undergr, Zn
Asst Gen Supt: E O Bonner
Mine Supt: Dan Griffin
MOUNTAIN CON MINE, Butte,
dist, undergr, Cu
Asst G a Supt: W R C Russell
Mine Supt: John Buttle
STEWART MINE, Butte dist
undergr, Cu
Asst Gen Supt: W R C Russell
FIRE FILLING DEPT
Asst Gen Supt: H M Strook
Frm: James Ballard
GREAT FALLS REDUCTION
WORKS, Great Falls
Mgr: F S Weimer
Gen Supt: L J Ingvalson
Asst Gen Supt: L C Powell
Mech Supt: C R Hill
Met: R J Lappe
Ch Clerk: W P Snodden
ELECTROLYTIC & FURNACE
COPPER REFINERY
144,000 & 138,000 tons per year
Supt: S R Westgard
Asst Supt: G Cadwell
EAST HELENA SLAG
TREATING PLANT
Supt: E L Thompson
Asst Supt: A B Kane
ANACONDA REDUCTION
WORKS, Anacanda
Mgr: S A Emanuel
Gen Supt: F H Day
Asst Gen Supt: J R Moore
Proj & Dev Eng: C H Holstrom
Supt Emp Relations:
C F Milwick
Supt Concentration: F A Roeder
Supt Smelting: E S Kramlick
Supt Rev: E O O'Leary
Supt, Com & Casting:
J T O'Donnell
Supt, Dust Treat:
J J Dougherty
Supt Zinc Plants:
F A Salomonson
Supt Roasters: A C Bigley, Jr.
Supt Zinc Electrolytic Casting:
K O Sweeney
Supt Phos & Acid Plants:
K F Buckwardt
Supt Mng Plants: E O Strommen
Dir Met Research:
F D Holderrreed
Asst Dir Met Research:
R E Sullivan
Testing Eng: T G Fulmer
Met: J H McCrea
Ch Chem: E N Boyce
Mech Supt: R F McCarren
Supt Const: M A Buehke
Ch Draftsman: E F Dimock
Hygiene, Vent Eng: H F Morris
Safety Eng: W J Needham
Supt, Slag & Tailings Disposall:
J A Grant
Supt Tram: I C Gnosse
Supt Emp: F X Barich
Supt Surface Dept: J F Sladich
Supt Fire & Watch Dept:
J J Dillon
Supt, Repair Foundry:
H M Hansen

COPPER CONCENTRATOR
30,000 tons per day
ZINC CONCENTRATOR
4,000 tons per day
MANGANESE CONCENTRATOR
1,500 tons per day
COPPER SMELTER
150,000 tons per year
ELECTROLYTIC ZINC PLANT
86,400 tons per year
SULPHURIC ACID
600 tons 80° Baume Acid per day
TREBLE SUPERPHOSPHATE
100,000 tons per year
**MANGANESE MODULING
PLANT**
415 S D T per day
FERROMANGANESE PLANT
3,250 S D T per month
ARSENIC PLANT
1,000 tons white arsenic per
month
(See Calif, Idaho, Nev, N Mex,
N Y)

ANDERSON, DAVID
32 Central Drive, Cobanbia
Gardena, Butte
TUXEDO MINE, Silver Bow
Co, undergr, Au, Ag
**BALTIMORE SYNDICATE
LTD**
S C M Wagner, Heppner, Ore

MINE, Jefferson Co, undergr,
Pb, Zn, Cu
(See Oregon)

BANKS, HOWARD C
Box 314, Deer Lodge
HIDDEN HAND MINE, Powell
Co, undergr, Au, Ag, Pb, Zn

BLACK & WHITE MNG CO
2325 Cloverdale Dr, Missoula
Pres & Gen Mgr: Roger F Little
VP: Geo T Croonenberghs
Sec: Margaret W Little
BROOKLYN MINE, Maxville, 4
mi N of Phillipsburg, undergr,
surface, Ag, Pb, Zn, Cu
Under devel
D-G MINE, Maxville, Ag, Pb,
Cu, Au, Bi, USOs
Under devel
250-TON FLOT MILL, at mine
(Leased to Treasure State
Uranium Co, Butte, & Silver
Butte Mine Ltd., Vancouver BC)

BUNKER HILL CO
Kelllogg, Idaho
MINE, Elliston, Phosphate,
undergr.
Under devel
(See Idaho, Calif, Wash)

CARPENTIER, TED
Radersburg
MUD SPRINGS CLAIMS, Au, Ag,
Pb, Zn
Under devel

CHARTER OAK MNG CO
Box 565, Elliston
CHARTER OAK MINE,
Elliston, 5 mi S of Elliston
undergr, Pb, Ag, Au, Zn
Gen Mgr: J T Bonner
Under devel
50-TON FLOT MILL, at mine
Under devel

CHEFF, A J
10054 W Marginal Hwy,
Seattle, Wash
PALMER KNIGH PLACER,
Broadwater Co, Au

CONTACT MINING CO
524 Washington St, Butte
Gen Mgr: Peter Antonelli, Jr &
Frank M Antonelli
SCRATCH ALL MINE,
Phillipsburg, undergr, Ag, Zn
Mn, Pb
HIGHLAND PHOSPHATE MINE,
Butte, 13 mi S of Butte, undergr
& surface, phosphate
Idle
BURLINGTON MINE, Silver Bow,
Mn
Idle
PHOSPHATE MINE, Highland
Dist, phosphate rock
Idle
TZARINA MINE, Butte Dist
Mn, Zn
Idle
WHITEHALL MINE, Whitehall
dist, Jefferson County, Au, Ag,
Pb, Zn
Idle
SCRATCH ALL & CONTACT
MINE, Flint Creek dist, Mn
Au, Ag, Cu, Pb, Zn
Under devel
MAYFLOWER MINE, Whitehall
Au, Ag

**CONTINENTAL RARE
METALS INC**
PO Box 109, Hamilton
Pres: A V Jenna
Sec: Wm Mayel
Treas: E C Gess
WEST FORK COLUMBIUM
MINE, Ravalli County, undergr
Co, rare earths
Gen Mgr: D N Jenkins
Geol: Dr Harley A Bill
Under devel
WOLF CREEK COPPER MINE,
Wolf Cr, undergr, Cu, Ag
Under devel
SMELTER, East Helena

**CREIGHTON MINE &
MILL**
14 No Tracy, Boxeman
Ore: R B Farnsworth
EL FLEDA MINE,
Fairweather Mng dist, Virginia
City, undergr, Au, Ag
Under devel
CRUMS, RAY W
Avon
HUMDINGER MINE, 21 mi N

of Avon, undergr, Au, Ag

Under devel
4-TON GRAY MILL
Under devel

CUMMINGS-ROBERTS
730 N Highland Ave
Los Angeles 38, California
Gen Part: H Evan Roberts
CRYSTAL MT MINE, Box 886
Darby, 26 mi E of Darby, open
pit, Co²
Gen Mgr: John W Taber
Mine Supt: Gordon Blackburn
Prod: 800 tons
500-TON HEAVY MELL
Ravalli County
Assayer-Chem: William Dickel
(See Calif)

**CURLEW MNG & DEVEL
CO**
Box 248, Stevensville
% Marian McFadden
MINE, Ravalli Co, undergr,
Au, Pb, Zn, Cu

**DOMESTIC MANGANESE
& DEVEL CO**
Box 117, Butte
Pres & Purch Agt: J H Cole
VP: S A Pumphrey
Sec-Treas: Cathryn C Keith
400-TON FLOT MILL, with
nodulizing oxide and carbonate
ore

**EASTON-PACIFIC &
RIVERSIDE MNG CO**
Virginia City
VP: R Olson
Sec & Treas: F Olsen
Purch Agt: M A Mortensen
MINE, undergr
Mine Supt: M A Mortensen
Asst Mine Supt: L E Kingley

ELKHORN MNG CO
Boulder Bank Bldg, Boulder
Pres, Gen Mgr & Purch Agt:
Wade V Lewis
VP: Hugh S Cannon
Sec-Treas: J T Lewis
ELKHORN & FREE ENTER-
PRISE MINES, Elkhorn & Boulder
undergr
Geol: Wade V Lewis
Mine Supt: Harold J Giulio
Under devel

ELLISTON LIME CO
303 N Ewing St, Box 803,
Helena
Pres: Gertrude L. Kuehn
Sec & Treas: Margaret H Kuehn
Gen Mgr: A L Gallagher
MINE, Calcium, undergr, open
pit, lime high calcium quick
& hydrated silt limestone
Prod: 180 tons daily
Mine Supt: A L Gallagher
MILL, at mine
Mill Supt: A L Gallagher

FAITH MNG CO
Box 1881, Helena
Pres: T D Tobin
VP: G M Vaughn-Rhys
Sec: Blanche Mares
LIBERTY MINE, Monarch
Barker mg dist, undergr,
Ag, Pb, Zn, Au
Under devel

**FALLIS, W R &
LISKE, L F**
Basin
BOULDER MINE, Jefferson
Co, Au, Ag, Zn

**GARRETT MNG & MLO
CO**
PO Box 324, Anaconda
Own: Eugene Garrett
MICKEY MINE, Red Lion Mng
dist, undergr, Au, Bi, Ag
18-TON-GRAV-CONC-AMAL
MILL, 1/4 mi from mine
Under devel

HAMILTON MINES, INC
Lewistown, Montana
Pres: P V Grande
VP: C Herstein
Sec & Treas: G Voldseth
Gen Mgr: G Voldseth
YELLOWSTONE MINE, undergr
under devel

HO & HOCO, INC
PO Box "D" White Sulphur
Springs
Pres & Purch Agt:
C R Oliphant
VP: Ed C Hughes
Sec-Treas: Albertina Green

CUMBERLAND MINE, Meagher
County, Castle Mt dist,
undergr, open pit, Ag, Cu
Under devel

**HALF MOON MNG CO,
INC**
Hedden Bldg, Billings
Pres: George Guay
VP: William G Mount
Sec-Treas: Harvey Guay
HALF MOON MINE, Big
Timber Creek, Sweet Grass
County, undergr, Pb, Ag, Au
Gen Mgr: George Guay
Wm G Mount
Under devel

HAND MINE
Argentina
Own & Oper: John Hand, Dillon
MAULDEN MINE, Argentina
dist, Ag, Au, Pb, Cu, Zn
Mine Supt: Bill Hand, Dillon
IRON MT CLAIMS adjoining
mine

HEDEVAL, AL
Basin
LOTTA MINE, Basin, undergr,
Au, Ag
Under devel
GRAY MILL, at mine
Prod: 3 tons daily
(Mine part of Basin Jib Gold
Mines, Inc)

HERA EXPLORATION CO
Box 4, Clinton
Pres: W H Pillatos
VP: M G Chamberlain
Sec-Treas: George Ames
HIDDEN TREASURE MINE,
Clinton, undergr, Cu, Ag, Au,
Pb
Gen Mgr: W H Pillatos
Gen Supt: M L Bohn
Geol: Dave Hintzman
Under devel
Mine Frnt: Chas Bissell
Mine Eng: Billy Hicks
50-TON FLOT MILL, Clinton
Mill Supt: Dewey Fisher
Assayer: Dave Hintzman
(See Wash)

HERR, F E
Box 168, Dillon
CHARTER OAK MINE, Blue
Wing dist, Beaverhead City
Ag, Pb

**HIDDEN SPLENDOR MNG
CO**
304 First Security Bldg,
Salt Lake City, Utah
Pres: A P Kibbe
PHYON MOUNTAIN MINE,
Carbon Co, undergr, U³O₈
BICE MINE, undergr, U³O₈
(See Colo, Utah, Wyo, N Mex)

HOPKINS, JOHN F
401 N Montana, Helena
NEGROS MINE, Elliston, Pb
Ag, Au, undergr,
Idaho

HOVELAND, OSCAR
Radersburg
Mgr: Oscar Hoveland
GUILTY CLAIM MINE, Au
Under devel

IDEAL CEMENT CO
601 Denver National Bldg
Denver 2, Colo
HANOVER MINE, Fergus Co,
undergr, gypsum
(See Colo)

LEE & WARD INC
Box 8, Jefferson City
Pres: Paul R Lee
VP: Virgil Ward
Sec: Clyde Bradley
PRICKLEY FEAR MINE,
Jefferson City, placer
Idle

LEHMAN, WALTER
Box 780, Lewistown
Own: Walter Lehman
SIR WALTER SCOTT MINE, 70
mi W of Lewistown, undergr, Ag
Pb, Cu, Zn, Au
Under devel

AMERICA MINE, 35 mi NE of
Lewistown, undergr, Pb, Ag, Au
Fluorine
Under devel
CHRISTOPHER COLUMBUS
MINE, undergr, As, Ag, Pb,
Cu
Idle

GOLD BUG MINE, undergr,
Au, Ag, Cu
(Leased)
Under devel

LEWING, LAWRENCE
Box 74, Lewistown
SHEEP MOUNTAIN MINE,
undergr,
Under devel
MILL, Helena

**LEXINGTON SILVER-
LEAD MINES, INC**
621 Columbia Bldg, Spokane 4
Pres: J A Allen
Sec: F A Engard
LEXINGTON & BIG SEVEN,
Nehalem, undergr, Ag, Pb, Au
Zn
Gen Mgr: J A Allen
Under devel & Producing
FLOT MILL, at mine
Prod: 125 tons daily

LINDBOM, WAINO W
1545 1/2 7th Ave, West,
Kalispell
FLATHEAD MINE, undergr
and open pit, Au, Ag
(Leasing from Anaconda Co,
Hog Heavens Mining)

**LITTLE ROCKIES MNG
& DEVEL CO**
Landusky
Pres: Frank B Bryant
VP: Edward F Wiegand
Sec & Treas: Cecil Flinders
Purch Agt: Marion Heller
LITTLE BEN MINE, Landusky,
undergr, Au, Ag
Gen Mgr: Marion Heller
Supt: E E Wiegand
Geol: Barney Egitt
Under devel
100-TON FLOT & CYAN MILL,
Landusky
Gen Mgr: Marion Heller
Mine Eng: Frank B Bryant

LIVELY MINING CO
Box 96, Melrose
Pres: R B Lively
VP: Burr Lively
HECLA MINE, undergr, Pb,
Zn, Au, Ag

LUKE, RUSSELL B
1021 E Front St, Butte
JACK PINE PHOSPHATE MINE
9 mi N E of Elliston, undergr,
Under devel
LUKE'S SILICA QUARRY, 6 mi
W of Anaconda, open pit

**MARTIN BROTHERS
MINING CO**

Box 314, Hot Springs
Pres: O F Martin
VP: Irene Martin
Sec & Treas: R E Martin
Purch Agt: O A Martin
MINE, undergr, open pit
Gen Mgr: O F Martin
Asst Gen Mgr: R E Martin
Mech Eng: R E Martin
Under devel

MIDLAND MNG CO
714 Midland Natl Bank Bldg,
Billings
MINE, U³O₈

**MINERALS ENG CO
MONTANA TUNGSTEN
DIV**

305 Montana, Dillon
Pres: R G Sullivan
Asst to Pres: R W Price
Sec: G F Wilson
Treas: Richard Warren
Gen Mgr: B T Burwell
Purch Agt: R W Warren, Jr
CALVERT TUNGSTEN MINE,
7 mi W of Wise Riv, open pit,
Wyo
Under devel
CARTER IRON MINE, 8 mi E
of Dillon, Pb
1,000-TON FLOT MILL, 5 mi
NW of Glen
Mill Supt: Earl Craig
(See Utah)

MINERAL KING MNG CO
Dixon Bldg, Missoula
Pres: C F Bula
VP: Marie E Bula
Sec & Treas: M Swanson
MINE, Galters, undergr, Pb, Ag
Gen Mgr: C F Bula
Asst Gen Mgr: F Mass
Gen Supt: Dan Mass
Geol: Jay Norling
Mine Supt: F Mass

Asst Mine Supt: Dan Mass
Under devel
TARBOX & MEADOW
MOUNTAIN MINE, undergr, Au
Ag, Pb, Cu
**MINERAL MNG & MLO
CO INC**
Box 41, Boseman
Pres: Peter Strom
VP: Joseph J Almirall
Sec-Treas: Thomas G McGrath
ASBESTOS DEPOSIT, undergr
open pit, phoscor, asbestos
Gen Mgr: Thomas G McGrath
Asst Gen Mgr: Barney Peck
Geol: Robert Crawford
Metall: Emile R Abodie
Prod: 50 tons asbestos per
day (placer)
Under devel

MONTANA CLIMAX CORP
Box 431, Phillipsburg
Pres: James R Hunter
Own: James A Peore Jr, Butte
CLIMAX MINE, Phillipsburg,
undergr, Mn
Under devel

MONTANA IRON MNG CO
PO Box 453, Stanford
Pres & Purch Agt:
D F Whittaker
Dir: Lemuel G Wiegand,
Morton K Whittaker
VP: A E Hall
DEWEY MINE, open pit, Fe
Asst Gen Mgr: Ed Hall
BOBCAT MINE, Sweet Grass
Co, Magnetite
MILL, 18 mi S of Stanford
(See Wash)

**MONTANA PHOSPHATE
PROD**
Garrison
Pres: W G Jewitt
VP: F E Burnet
Sec: E G Randall
GRAVELEY, GIMLET & LUKE
MINES, 8 mi N W of Avon,
BROCK MINE, 8 mi NW
Garrison, undergr, open pit,
phosphate rock
Gen Supt: F E Burnet
Mines Supt: C W Moon
Geol: L V Bell
Mines Acct: N Aked
Mines Angr: A M Scott
Mines Frnt: C R McDonald
L Brander, L Keon
Under devel
Prod: 1500 tons daily

**MONTANA STANDARD
MNG CO**
Wallace
Pres: Loy L Voss
MONTANA STANDARD MINE,
Prospect Cr dist, Sanders City,
Ag, Pb, Zn, Au, Cu

NANCY LEE MINES, INC
410 Main St, Kellogg, Idaho
NANCY LEE GROUP, Superfor
undergr, Ag, Cu, Pb, Zn
KING & QUEEN MINES, Ag
Cu, Pb, Zn
125-TON FLOT MILL

NAT'L LEAD CO
BAROID DIV
Box 1675, Houston 6, Texas
GREENOUGH PLANT, Jigging
grinding
Mine & Mill Supt: J P Murphy
(See Ark, Calif, Colo, Kan,
La, Mont, Mo, N Y, Tenn,
Tex, Wyo)

NATIONAL URAN CORP
510 Bank St, Wallace, Ida
CLAIMS, LITTLE JOE MINE,
Boswell Co, U³O₈
Idle
(See Idaho)

**NEW MINE SAPPHIRE
SYNDICATE**
Box 941, Billings
YOGO SAPPHIRE MINE, Yogo
Gulch dist, near Lewistown,
Sapphires

NONPAREIL MNG CO
801 Milwaukee Ave, Deer
Lodge
Pres: E M Bisenberg
Sec-Treas: Claude H
Bisenberg
NONPAREIL MINE, 6 mi E
of Maxville, undergr, open
pit, Pb, Ag, Au
Idle

**NORTH WESTERN MNG
& EXPL CORP**
8 SW 136th St, Seattle 98
Wash
Pres: Albert L Workman
VP: Lyman Batley
Sec-Treas: James E Williams
THIRD TERM MINE, Powell
County, undergr, Pb, Cu, Au
Ag, Zn
Gen Supt: James E Williams
Under devel
(See Utah, Wash)

NORTHERN MLLG CO
Townsend
MARIETTA MINE, Broadwater
County, undergr, Au, Ag
250-TON FLOT MILL

**NORTHERN MNG & MLO
CO**
PO Box 261, Townsend
Pres & Purch Agt: Paul I Raber
VP: Loren J Anderson
Sec: Alfred S Ophus
Treas: P C Bakken
Mines Supt: Ed F Wiegand
HAWKEYE MINE, Zortman
undergr, open pit, Au, Ag
Under devel
MARIETTA MINE, 14 mi W of
Townsend, undergr, Au, Ag, Pb
200-TON FLOT MILL, at
Marietta Mine

**NUCLEAR FUELS &
RARE METALS CORP
INC**
Pocatello, Idaho
Pres: D B Lewis
MINE, in Lemhi Pass area on
Continental Divide between
Idaho & Mont, Th, Ch, Ta
Rare Earths
Under devel
(See Idaho)

NYGREN, RUDY
Dilina
Owner
FERDINAND MINES, undergr,
Pb, Zn, Ag, Cu, Au
Idle
GRAY MILL, at mine
Prod: 20 tons daily

**OBELISH EXPLORATION
CO**
1327 W Granite, Butte
Pres: J Goodrich
Mgr: J LaComb
MINE, 2 Mi E of Basin, Ag, Pb
Zn

P K F M & B CO
c/o Frank Burgess, Atty,
Butte
MAJOR BUDD MINE, Rampart
Mt dist, near Butte, Au, Ag
Pb, Cu
Under devel

PLANET EXPLOR CORP
PO Box 64, Boseman
THUMPER MINE, 36 mi S of
Boseman, Gallatin Range, under-
gr, open pit, Muscovite mica
Gen Mgr: Chas M Hauptman
Mine Frnt: Louis Evans
Prod: 500 lbs
(See N Y)

PRUETT, BILL
Box 442, Whitehall
COLORADO MINE, Madison Co,
undergr, Au, Ag

RADON RESEARCH
Blunder
Pres & Purch Agt:
Wade V Lewis
VP: Theodore Nyquist
Sec-Treas: J T Lewis
URANIUM MT MINE, Boulder
INDIANHEAD URANIUM MINE,
Basin, undergr, U³O₈
Geol: Wade V Lewis

**RALLS & HARRIS
BROS**
PO Box 114, Radersburg
IRON CROSS MINE,
Broadwater County, open pit
Fe
Prod: 45-50 tons

**RALLS, JOHN M &
ELSK, L**
PO Box 114, Radersburg
NORTH BUTTE MINE,
Radersburg, undergr, Pb, Au
Ag
Under devel

REINDL, ED
1346 W Silver St, Butte
CORN CRACKER MINE, undergr.
Madison Co, Au

RELYEA, GEORGE A
Box 83, Garrison
RELYEA MINE, 11 mi N of
Garrison, undergr, phosphate
Prod: 3,500 tons
KLEINSMIDT MINE,
Winston, undergr, Pb, Ag, Zn
Gen Supt: Mine Firm
Srn Hendrickson

ROCHFORD THREE
STATE MNG CO
310 Main St, Miles City
MINE, Pennington Co, S Dak
UOg
(See S Dak)

RUBY VALLEY DEVEL.
CO, INC
4316 S Montgomery St
Tacoma, W. Wash
RED PINE MINE, Sheridan
undergr, Au, Ag
Under devel
(See Wash)

RUSSEK MNG CO
83 E Park, Butte
Pres & Mng Eng:
Kenneth M Judd
VP & Gen Mgr:
Russell B Lake

Sec-Treas: Harriet Judd
LUKE JUDD SILICA QUARRY,
S mi W of Anaconda, open
pit, silica
Prod: 35,000-40,000 tons
per year

ST PAUL LEAD CO
PO Box 756, Kellogg
Idaho

SNOWSHOE & ST PAUL MINES,
Libby, Lincoln County, Pb,
Ag, Au, Zn, Cu
Prod: 150 tons
Mine Supt: A L Osborn
100-TON FLOT MILL, Libby
Mill Supt: O W Herlin
(See Idaho)

SAWYER PETROLEUM
CO

650 S Grand Ave, Los
Angeles 17, Calif
Pres: E W Sawyer, Jr
VP: J A Sawyer, R D Sawyer
Sec: C W Fawcett
LAST CHANCE MINE, Grant,
Mont, open pit, Th and rare
earths

Geol: L D Jarrard
Under devel
MILL, Salt Lake City, pilot

SIERRA TALC COMPANY
1608 Huntington Dr,
So Pasadena, Calif
YELLOWSTONE MINE, Madison
Co, Talc
Supt: W Stevens

J R SIMPLOT CO
FERTILIZER-MNG DIV
Box 912, Pocatello, Idaho
Pres: J R Simplot
VP & Gen Mgr:
W Grant Kilbourne

CENTENNIAL MINE, Montida,
38 mi E of Montida, open pit
phosphate
Gen Mgr: O E Pothier
Mine Supt: Dave Aro
Mine Eng: Leonard Garrard
Ida
(See Idaho, Nev, Wyo)

SISKON CORP
423 Cascade Bldg, Reno, Nev
Pres: H B Chessher, Sr
VP: E J Schrader
Sec: J E Chessher
Asst Treas: A L Chadek
YOGO SAPPHIRE MINE,
Judith Basin County, Montana
undergr & open pit
Gen Mgr: H B Chessher, Sr
Gen Supt: H B Chessher, Jr
Geol: M E Price
Metals: H L Hazen
Mine Supt: M R Biswell
GRAV-JIB MILL, at mine
Mill Supt: M R Biswell

SPOKANE NATIONAL
MINES, INC
Bannack
Pres: G H Allison
Exec VP: H J Tibbitts

HENDRICK MINE, Bannack,
undergr and open pit, Au
Supt: E H Brooks
CYANIDE MILL AND REFINERY
at mine
Prod: 100 tons daily
NEW DEPARTURE MINE,
Dillon, undergr and open pit,
Ag, Au, Pb, Zn, Cu
(Also see Idaho and Washington)

SWANSEA MINES, INC
Box 904, Helena
Pres & Gen Mgr: C L Hewitt
SILVER BELL MINE, 46 mi
N of Helena, undergr, Au, Ag
Pb, Cu
Ida

TAYLOR-KNAPP CO
Box FF, Phillipsburg
Pres: S R Knapp
VP & Gen Mgr: A V Taylor
Sec & VP: Alf C Kremer
Mgr: Donald S Johnson
Ch Eng: Charles P Kambel
MOONLIGHT GROUP, TRUE
PRESSURE & DURANGO MINE,
Phillipsburg, undergr, Mn, Ag,
Zn, Pb, Au
Mine Supt: Jack B McCoy
Ch Asst: Claude Sorensen
Mine Firm: Geo H Ratlie
100-TON GRAV-MAG MILL,
Phillipsburg
Mill Firm: G Kneale
Assay: F S Neal

TRI STATE MINERALS
CO

Box 237, Dillon
Own: A K Skeoch
KEYSTONE, TREASURE &
SMITH TALC MINE, Dillon
open pit, Talc
Div Mgr: J M Pyner
Mine Supt: Ernest Nygren
Geol: C F Joy

TROUT MNG CO

Box "K", Phillipsburg
TROUT-ALCONQUIN GROUP
MINE, Phillipsburg, undergr,
Mn, Ag, Pb, Zn
Gen Mgr: Roy McLeod
Asst Gen Mgr: Roy Hamilton
Mine Firm: T Furtle
Prod: 150 tons daily
FLOT & MAGNETIC MILL
Mill Supt: Roy Hamilton
Mill Firm: K Bauer
Prod: 150 tons of Ag ore
daily & 60 tons of Mn
ore daily
(See N Y)

UMONT MNG CO, INC

506 Silver Bow Bldg, Butte
Pres: L P Evans, Jr
Treas: R H Wadhams
NORWICH MINE, 3 mi W of
Butte, undergr, Mn, Ag
Gen Mgr: D D Wheeler, Jr
Res Mgr: Wilbur F Crawford
Mine Supt: Chas S Biswell
LITTLE SARAH MINE
Summit Valley dist, Mn
Ida

UNITED STATES
GYPSUM CO
300 W Adams St, Chicago 6
Ill

Pres: O M Knada
VP: H C Bear
Exec VP: G J Morgan
Sec & Treas: F L Stelner
VP Oper: E Rembert
SHOEMAKER MINE, Heath,
undergr, Gypsum
Gen Mgr: W E Seeburger
Asst Gen Mgr: C Q Rice
Mech Eng: B G Long
Mine Supt: W S Shahan
Prod: 400 tons daily
MILL, at mine
Mill Supt: J H Scott
Mill Firm: R E Von Ladena
(See Ill)

VALLEY MNG CO
532 North Ave W, Missoula
MINE, Granite Co., Bear
Gulch, placer, Au, Black
muds
West Oper: E C Boklenfelder
MILL, 1900 yds per day,
Fletcher washer
(See Wisc)

VARELIA MNG CO
c/o Sam Varelia, 821
Shields Ave, Butte
EASTERN MINE, Silver Bow
dist, Mn

SILVER CLEFT MINE, Summit
Valley dist, Mn
Ida

VICTOR CHEM WORKS

Box 1044, Butte
MAIDEN ROCK MINE,
Melrose, undergr, phosphate
rock
CANYON CREEK MINE,
Melrose, undergr, phosphate
under devel
Supt FCE & Mng Oper:
F B McCoy
Mine Supt: H F Johnson
Asst Mine Supt: R Gale
Mine Firm: E Kuky
Mine Eng: J Seymour
Prod Supt: H F Johnson
(See Ill)

YELLOWSTONE URANIUM
CO

Box 515, Hardin
Pres: A A Moser
SHAMROCK MINE, Silverstar,
undergr, Cu, Au, Ag
Ida
YOUNG-MONTANA CORP
2223 1st Ave, Hibbing Minn
Pres: E A Young
VP: Joseph Levallo
Sec-Treas: Thomas McCabe
WILLOW CR MINE, Stanford
18 mi N of Stanford, open pit,
Fe

ZIMMERMAN, WILLIAM

Townsend
ERICKSON #1, 2, 3, Broadwater
Co, undergr, Au, Ag, Pb

ZONOLITE CO

133 S LaSalle St
Chicago 3, Ill
Pres: J A Kelley
VERMICULITE MTN MINE,
Libby, open pit, vermiculite
cumulates
Gen Mgr: R A Bleich
Asst Gen Mgr: E D Lovick
Geol: R J Kujawa
Mech Eng: D W Robinson
Met: W Sabinen
Purch Agt: B J Dorrington
Mine Supt: R J Kujawa
Mine Firm: Orville Thorne
3,000-TON GRAV MILL, near
Libby
Mill Supt: Harold Platt
Mill Firm: Walker Baker
(See Ill)

NEBRASKA

AMER SMLTG & REF
CO OMAHA SMLTR &
REFINERY
Omaha
Mgr: Ray C Skow
Gen Supt: J C Reinhardt
(See Ariz, Calif, Colo, Idaho,
Ill, Md, Mont, N J,
N Mex, N Y, Tex, Utah, Wash
& Federal Mng & Smelting Co,
Mia)

**MILLER &
FENTRESS MNG CO**
Box 326, Hemingford
(See Wyo)

SWEETWATER CHEM
CO
6660 Military Ave, Omaha
MINE, Carbon Co, Wyo, open
pit, Sodium Sulfate
(See Wyo)

NEVADA

ALA, JOHN F
Mills
GOLD NOTE MINE, Elko
County, Pb, Zn

ALPINE DEVEL CO
c/o Chris Mann,
Gardnerville
Pres: Chris Mann
Sec-Treas: W E Slater
QUITE MINE, 16 mi S of

Yerington, open pit, Silica
Sand, Clay
Under devel

**ALAMONT MNG &
URANIUM CO**
50 E 10th St, Bountiful, Utah
MINE, Midas via Golconda,
undergr, Au, Ag
Gen Supt: Robert H T
Dunsmuir
Under devel
(See Utah, Colo)

AMERICAN CANYON
MINES
11 Sandy Circle, Denver 23
Colo
Own: Harry H Herman
AMERICAN CANYON MINE,
Rochester Mining dist,
S mi E of Oresana in American
Canyon, undergr, open pit,
Hg, Au, Kacila
Gen Mgr: Harry H Herman, Jr
Asst Gen Mgr: Peter D Wulfsch
Under devel
200-TON GRAV MILL, at mine
REFINERY, at mine
Metal output: 800 lbs of Hg
daily

AMERICAN GEM MNG
CO
Tonopah
LONE MT TURQUOISE MINE,
undergr, Au, Ag
Ida

ANACONDA COMPANY,

THE YERINGTON MINES
Box 1800, Weed Heights
Gen Mgr: A E Miller
Asst Gen Mgr: H R Burch
Mine Supt: C J Houch
Plant Supt: A J Gould
Gen Mine Firm: D K Gill
Gen Plant Firm: F R Moninger
Ch Clerk: H L Chesarek
Pers Superv: K W Humphreys
Storekeeper: R K Owen
Master Mech: R E Bentley
Superv Rep & Maint of Mobile
Equip: M G McCallum
Ch Elect: M H Bissett
YERINGTON MINE, 61 mi SE of
Reno, surface, Cu
Prod: 12,000 tons
12,000-TON LEACH & PRECIP
PLANT
(See Calif, Idaho, Mont, N Mex,
N Y)

ANTELOPE MNG CORP

313 N G St., Lakesview
Gen Mgr: M E Weatherly
MINE, open pit, Hg, Au
Prod: 100 tons daily
Under devel
GRA MILL, Lone Pine Dist,
Washoe Co
Prod: 100 tons daily
SMELTER, at mine

APEX MINERALS CORP

317 Clay Peters Bldg, Reno
Pres: Wm R Nisack
VP: Carson Frasnini
Sec-Treas: N B Naismith
Gen Mgr: Fred Vollmar
Gen Supt: Hugh Cameron
Geol: Harry Hughes
Met: Albert Silver
APEX URANIUM MINE, Austin
undergr, UOg
200-TON MILL, Austin

AQUAFIL CO

PO Box 94, Los Altos
Supt: Lowell Smith
AQUAFIL MINE, 35 mi
NE of Fernley, diatomite
CHICK BED MINE, 27 mi NE
of Fernley, diatomaceous
earth
MILL, Fernley
Mill Supt: Lowell Smith

ARGENTITE ACCOUNT

c/o H B Humphrey
Silver Peak
Part: F J Sharley, L H Shirley,
S M Chabovich,
H R Humphrey
MOHAWK MINE, Esmeralda
County, undergr, Ag
Mine Supt: Tom Kelly
(Leased to U S Mill & Minerals
Co)

ARGENTUM MNG CO OF

NEVADA
Box 134, Mina
Pres: E S Gates
VP-Treas: C E Earl
Sec: J A Crowther

Asst Sec: C E Earl
Purch Agt: Anthony Buccell
Judd Hancock
NORTHERN BELLE-HOLMES-
MT DIABLO, LUCKY HILL
Candelaria, undergr, open
pit, Au, Ag
Mine Supt: John Giammi
Gen Mgr & Asst: E S Gates, Jr
Asst Gen Mgr: C E Earl
Gen Supt & Geol: Jas Goldworthy
Mech Eng: Clifford A Ripley
Prod: 3500 tons
3000-TON-FLOT-CYANIDE
MILL, Columbus Marsh
Mill Supt: Roy Williams
3000-TON BULLION SMELTER,
Mina
Smelter Supt: Anthony Buccell

ATLANTA GOLD &

URANIUM CO
Box 248, Pioche
Pres: J E Little
VP & Gen Mgr: C E Collins
Sec-Treas: Wm R Robertshaw
Directors: Ray A Hardy,
K L Knouting, J E Little,
Wm R Robertshaw,
C E Collins
ATLANTA MINE, 61 mi NW
of Pioche, Atlanta dist, open
pit, Au, Ag, UOg
Consult Eng: Roy A Hardy
Ida

BASE METALS

PRODUCTION, INC
5306 Evergreen, Las Vegas
Pres: W J King
VP: F Knuth
Sec & Treas: W R Morse
MINE, placer, Au, Ag
Gen Mgr: W F King
MILL, Johnson Mining Dist
Prod: 850 tons daily
SMELTER, Nye Co, Nev

BASIC INC

PO Box 4, Gabbs
Furch Agt: W A McDonald Jr
Works Mgr: H F Willard
Works Eng: J F Jankovic
Mine Supt: A M Dumas
Asst Mine Supt: T M Cahill
Mine Supt: F W Menel
Asst Mill Supt: Ray E Sutton
Mine Firm: W P Smith
Ch Chem: K B Thompson
GABBS MINE, open pit,
Magnetite, Brucite
Prod: 1000 tons per day
FLOT-HEAV-MED MILL
Rotary Kiln & Herreshoff
Furnace, Gabbs
(See Ohio)

BELMONT LEAD CORP

PO Box 66, Ely
Pres: R DeVivo
VP: T Kite
Sec & Treas: D Boothby
Board of Dir: R W Moore
MINE, undergr, Pb, Ag
Gen Mgr: T Kite
Asst Gen Mgr: D Boothby
Gen Supt: J Bonty
Met: J Bonty
Mine Eng: R A Moore, Jr
MILL, at mine
Mill Supt: J Bonty
Prod: 250 tons daily

BELMONT MINE CO

Tonopah
COMPANY 9 MINE, undergr,
Ag

BIG DIVIDE MNG CO

Box 511, Tonopah
Supt: J H Smith
TONOPAH DIVIDE MINE,
undergr, Au, Ag

BLUE DIAMOND CO

DIVN OF FLINTKOTE CO
1650 S Alameda St
Los Angeles 54, Calif
BLUE DIAMOND MINE, open
pit, gypsum
Works Mgr: H L Waidhausen
Jr

Elec Eng: R Damagan
Maint Supt: F Day
Safety Eng: M Rundall
Admin Asst: K H Zahn
Mill Firm: Frank Asginalski
Board Plant Supt:
E Guthnecht

Loading Supt: S Comer
Qual Control Supt:
R H Whitney
Mine Supt: M C Brooks
Asst Mine Supt: J Cain
Prod: 1400 tons per day
(See Calif)

BOGDANICH DEVEL CO
Box 13, Paradise Valley
Supt: H B Jarvis
CANILL MINE, undergr, Hg

BRISTOL SILVER MINES CO
PO Box 218, Pioche
BRISTOL SILVER MINE, Pioche, undergr, Cu, Ag, Zn, Pb
Gen Mgr: Byron S Hardie
Gen Supt: Arthur J Bosch
Prod: 50 tons per day
(See Utah)

COMBINED METALS REDUCTION CO, NEVADA OPERATIONS

Pioche
Gen Mgr: Paul Gemmill
Asst Mgr: H E Swanson
Gen Mine Supt: R G Lee
CASELTON MINE, 3 mi W of Pioche, undergr, Zn, Pb
Mine Frm: J L Stewart
Idle

COMET MINE, 20 mi W of Pioche, undergr, Zn, Pb
Idle

700-TON CASELTON MILL
FLT-HMS, Zn, Pb
Idle
400-TON PANACALITE MILL
Crushing & grinding, crude perlite
Mill Supt: C H Lihine
(See Utah)

CONSOL EUREKA MNG CO
Eureka

Gen Mgr: Sherman B Hunkley
Asst Gen Mgr & Mine Supt: Dean P Thirion
DIAMOND MINE, 2 mi from Eureka, undergr, Pb, Ag, Au
Prod: 25-30 tons
(See Utah)

CONTINENTAL MATERIALS
Midas
LUCKY BOY MINE, undergr, Au, Ag

COONEY & SONS
Lovelock
SOUTHERN PACIFIC MINE, open pit, Fe

CORDERO MNG CO
131 University Ave
Palo Alto, Calif
VP: S H Williston
CORDERO MINE, McDermitt, 14 mi SW of McDermitt, undergr, Hg
Gen Mgr: J Eldon Gilbert
Asst Gen Mgr: Verno P Haas
Gen Supt: Bert Mitchell
Supt: Cliff Altig
(See Calif, Idaho)

COURVOISIER, CHAS H (OWN)
Box 470, Susanville, Calif
TICK CANYON MINE, Washoe County, undergr, U₃O₈
Under devel
RED POINTS MINE, Washoe County, U₃O₈
Genl: Wade Dale
Under devel

CROWELL, J IRVING, JR
PO Box 98, Beatty
CROWELL DAISY MINE, Nye County, undergr, CaF₂
Prod: 25 tons

DAKIN, FRED H
3811 Hillside Dr
Burlingame, Calif
CERVANTITE MINE, 23 mi E of Lovelock, undergr, Sb
Idle

D. YTON CONSOL MINES CO
PO Box 721, Carson City
Pres-Purch Agt-Gen Mgr: R R Weideman
VP: Laurence Howe
Sec-Treas: W T Anderson
DAYTON, KEYSTONE, OEST & NEW YORK MINES, Silver City, undergr, open pit, Au, Ag
Idle
150-TON FLOT CYANIDE MILL
Silver City

DE LONGCHAMPS, F J
Box 3244, Reno

TALAPOOSA MINE, 15 mi S of Fernley, undergr, Au, Ag
Idle

DESERT TREASURE MNG
1126 Ebas Ave, Reno
Owner: James E Smith
MINE, Mina, open pit & placer
Hg
Gen Mgr: J E Smith
Under devel

DODGE CONSTRUCTION CO
PO Box 11, Fallon
IRON HORSE GRP, THOMAS-PARKEN BROS MINE
Pershing County, Fe

DIXIE MINING CO
Midas, Nev, Via Golconda, Nev
Pres: R T Dunsmore
VP: G M Schluta
MINE, Au, Ag
Mine Eng: R H T Dunsmore
Prod: 10 tons daily
Under devel

EAGLE-PICHER CO, INSUL DIV
PO Box 1869, Reno
CLARK PLANT & MINE
22 mi E of Reno, open pit, diatomaceous earth
Gen Mgr: John W Kenney, Jr
Asst Gen Mgr: Milton Steinhilber
Mine Supt: Clay Smith
Prod: 150 tons per day
150-TON MILL, Clark
Mill Supt: Frank Dodick

LOVELOCK PLANT & MINE
Box 346, Lovelock, plant & 5 mi E of mine, 25 mi W of Lovelock, open pit, diatomaceous earth
Gen Mgr: John W Kenney, Jr
Asst Gen Mgr: Milton Steinhilber
Mine Supt: Clay Smith
Prod: 120 tons per day
120-TON MILL, Colorado
Plant Mgr: Ralph W Vocum
Mill Supt: Emmett Spencer
(See Ill, Kans, Ohio, Okla, Wis)

ENERGY LAND & DEVELOPMENT CO
253 Fremont St, Las Vegas
Pres: S of Neighbors
VP: G Nicot
Sec: Mrs Zita M Hayden
ESMERALDA MINE, Au, Ag, WO₃
Gen Mgr: S of Neighbors
Asst Gen Mgr: N Atwood

ERRINGTON-THIEL MNG CO
THIEL MNG CO
Ruby Valley

Own & Mgr: Oscar W Thiel
RED MICA MINE, Ruby Valley, 65 mi SW of Wells, undergr & surface, ruby mica, beryl, rare minerals
Idle
HOLIDAY COPPER MINE, 60 mi S of Wells, undergr & surface, Cu, Zn, rare minerals
Under devel

ESTABROOK BARITE CO
613 Camp St, Carlin
MINE, open pit, Ba

EUREKA CORPORATION, LTD
Eureka
Pres: Nell O'Donnell
Sec: R E Thomson
Treas: Jesse M Robinson
Purch Agt: Willie A DePaoli
RICHMOND-EUREKA MINE, 2 mi W of Eureka, undergr, Pb, Au, Ag, Zn
Gen Supt: Robert N Breckenridge
Mine Supt: Vernon Mann
Mine Eng: Walter Paroni
Idle

FIBREBOARD PAPER PRODUCTS CORP
PO Box 4145, N Las Vegas
APEX MINE, Ape, open pit, U₃O₈
Gen Supt: W E Lightfoot
Mine Supt: Geo Dakin
Asst Mine Supt: T E Barton
Prod: 1800 tons
1300-TON GRAV MILL, Apex
(See Calif, Colo)

FLINTKOTE CO, THE U S LIME PROD DIV
Box 137, Henderson
New Mgr: John MacDonald
SLOAN MINE, Sloan, Box A, open pit, dolomite,
Supt: Geo Rodriguez
APEX MINE, Box 1598, N Las Vegas, open pit
Plant Mgr: C H Cadwell
Quarry Supt: C R Prince
Frm: John Sanger
(See Ariz, Calif, Tex)

FOOD MACHINERY & CHEMICAL CORP (WESTVACO MINERAL PRODUCTS DIV)
Modesto, Calif
MOUNTAIN SPRINGS MINE, Battle Mountain, 22 mi S of Battle Mtn, open pit, Ba
Gen Mgr: D H McAuley
Gen Supt: A L Allen
Mine Supt: James Jury
Mine Frm: C N Lauritsen
(See Calif, N Mex and Intermountain Chem Co, Wyo)

G & L MNG CO
Gardner
ALLIED MINES, Nye Co, CaF₂

GARDNER MINES
Box 413, Ely
Gen Mgr: C A Gardner
MINERAL FARM & MERRIMAR GPS, 20 mi SE of Ely, undergr & open pit, Au, Ag, Pb, Zn
Prod: 10 tons

GETCHELL MINE, INC
Box 2530, Reno
Pres: George Wingfield
VP & Cons Eng: R A Hardy
Sec-Treas: T L Wilcox
GETCHELL MINE, Golconda, undergr & surface, WO, Au
Mine Supt: Wm J Newman
Met: Roy Nojima
Prod: 900 tons
1500 TON FLOT MILL, near Golconda
Mill Frm: David Kinsel
Assayer: Roy Nojima
Idle

GOLD EAGLE MINES
Box 768, Tonopah
SALLY LOUISE MINE, Esmeralda County, undergr, Au, Ag, Zn
Idle
(See Wash)

GOLDFIELD CONSOL MINES CO
Box 2530, Reno
Exec VP: Willis A Swan
Sec-Treas: Geo M Spradling
(See Calif, Wash)

GOLDFIELD ENGINEERING ASSN
Box 2431, Las Vegas
Pres: William R Poe
VP: Eldon L Carlisle
Treas-Dir: Walter R Averett
Sec: Margery Carter
Directors: William R Poe
Eldon L Carlisle
Walter R Averett
Harold V Lankford
COLUMBIA MT MINE, 2 mi N of Goldfield, undergr, Au
NEWMONT CYANIDE PLANT
1/2 mi from mine

GREAT LAKES CARBON CORP
Dicalite Dept, Mng & Mineral Product Div
PO Box 177, Mina
PLANT NO 1, Basalt, surface
diatomite
Mill Supt: John Graham
(See Calif, Colo, N Mex, Ore)

GREAT WESTERN MNG & DEV CO
Searchlight
SOUTHERN NEVADA MINE, Clark County, Au, Ag
Idle

HAMILTON CORP
PO Box 137, Ely
Pres: Morris Engle
ONETHA MINE, White Pine County, Pb, Zn

HEIZER, JOHN
Lovelock
HAZEN MINE, Pershing Co, open pit, Fe

HIDDEN SPLENDOR MNG CO
Ely
MT WHEELER MINE, White Pine Co, undergr, WO₃, Beryllium
(See Colo, Mont, Utah)

HUMBOLDT IRON MINES CO

Jungo
REDBIRD MINE, open pit, Fe

INDEPENDENCE GOLD MINE
1129 10th Ave, North Seattle 2, Wash
Gen Mgr: J J Logus
MINE, 19 mi S of Battle Mtn, Nevada, undergr, Au, Ag
Mine Supt: J B Cole

INDEX-DALEY MINES CO

114 1/2 N Main St
Salt Lake City, Utah
Pres-Purch Agt: Charles S Woodward
VP: R W Edmunds
Sec-Treas: Louise M Orton
INDEX MINE, Wells, undergr, Ag, Pb, Cu, Au
Gen Mgr: Charles S Woodward
Gen Supt-Mine Supt: George A Rich
Under devel
(See Utah)

IRON HAT MNG CORP
Box 642, Lovelock
Pres & Gen Mgr: E P Cox
MINE, 30 mi SE of Lovelock, open pit, Fe

ISBELL CONST CO, MNG DIV

Box 2351, Reno
Pres: C V Isbell
Mng Dept: John W Isbell
Ch Eng: H R Hood
Purch Agt: W J Henley
THREE KIDS MINE, open pit, contract mng for Manganese Inc, PO Box 684, Henderson, Mn
Supt: Lloyd Sampson
Eng: Manuel Peralto
(See Ariz, Idaho, Utah, Wash)

INDUSTRIAL MINERALS & CHEMICAL CO
5th and Gilman Sts
Berkeley 18, California
Pres: L R Moretti
VP: A J Hendrickson
Sec-Treas: A L Forbes
JUPITER MINE, Lyon County
open pit, clay
(See Calif)

JACKSON MT MNG CO
Jungo
IRON KING MINE, undergr, Fe

JUNGO CONTRACTORS INC
Box 148, Winnemucca
Mgr: C Bower
HUMBOLDT IRON MINE, Humboldt Co, open pit, Fe

KAMCO CO
Mina
BELLEVILLE MINE, 24 mi SE of Mina, undergr, Au

KENNECOTT COPPER CORP NEVADA MINES DIV

McGill
Gen Mgr: J C Kinnear, Jr
Asst Gen Mgr: M J O'Shaughnessy
Purch Agt: R M Arm
Div Comptroller: R A Crosser
LIBERTY PIT, VETERAN PIT, Ruth, open pit, Cu, Au, Ag, Mo
DEERUTH MINE, Ruth, undergr, Cu, Au, Ag, Mo
Undergr Mine Supt: Frank Quilici
Ch Eng: L A Green
31,000-TON FLOT CONCENTRATOR,
3 REVERSE SMELTER, McGill
Concen Supt: R R Levellie
Smelt Supt: E Pesout
Mech Supt: W M Mansfield
Prod: 100,000, 600 lbs Cu yrly
NEVADA NORTHERN NY (Bismut)
Gen Supt: H M Peterson
TRIPP PIT, Kimberly, open pit, Cu, Au, Ag, Mo
(See Ariz, N Mex, N Y, Utah, Min)

KOYEN, WEELEY
Templute

TEMPUTE SILVER MINE
Lincoln County, Au, Ag

L & N MNG CO
1129 10th Ave N, Seattle 2 Wash
Pres: J J Logus
TRENTON CANYON COPPER MINE, Battle Mt, undergr, open pit, Cu, Ag, Pb, WO₃
Gen Supt: V R Newbury
Geol: Forbes Robertson
Idle

LAMB & DICKMAN
Lans

ONE MERCURY MINE, undergr, and open pit, Hg
Supt: R Chiatovich

LONDON EXTENSION MNG CO

Beowawe
Pres: Fred C Bishop
VP: R W Fraser
Sec & Gen Mgr: H C Bishop Jr
Supt & Treas: R B Warmbrodt
GOLDACRES MINE, 19 mi S of Beowawe, surface, Au, Ag
Supt: E E Mahoney
Mine Frm: Angelo Manconi
Prod: 150 tons
450-TON CYANIDE MILL, at mine
Supt: C E Stewart
Asst Supt: Harold Bond

LOWARY URANIUM MINE CO

680 Mt Rose St, Reno
Pres: Howard E Maue
Sec-Treas: Nell Lowary
LOWARY URANIUM MINE, Open pit
Under devel

LYNN MINING CO
Box 1148, Carlin
MODARELLI MINE, Eureka Co, open pit, Fe
Gen Mgr: R Allen Lynn
(See Utah)

LSZ MNG CORP
c/o John A Hodman
PO Box 311, Pioche
MINE, Lincoln County, Pb, Zn
Idle

MAGNET COVE BARIUM CORP
PO Box 487, Battle Mountain

FIVE PITS MINE, 23 mi S of Beowawe, Ba
MILL, Battle Mountain
(See Ark, Tex, Wyo, Mo, Fla)

MANGANESE, INC
(Subsidiary of Howe Sound Co)
Box 2008, Henderson
Gen Mgr: William Kendrick
Mas Mech: Walter Barney
Purch Agt: L D Richardson
THREE KIDS MINE, Las Vegas Vash Rd, 6 mi E of Henderson, surface Mn
Mine Supt: Charles Hawkins
Ch Plant Eng: R Waters
Mine Eng: C Hawkins
Elec Eng: Russell Frith
Controller: J Millic
Ch Chemist: L J Hartsell
Prod: 1,200 tons day
1,200 TON FLOT MILL, at mine
Mill Supt: Ed Lowman
SMELTER
Supt: H W Cartwright
(See Howe Sound Co, N Y)

MINERAL MATERIALS CO

1141 Westminster Ave
Alhambra, Calif
Gen Mgr: C G Dutton
Ch Eng: M W Redhead
Res Mine Mgr: P W Leidich
Mine Frm: C A Butler
7000-TON MILL, at mine, jaw crusher, rolls, magnetic separators
BUENA VISTA MINE, 36 mi NE of Lovelock, surface, Fe
Prod: 2100 tons per shift
(See Calif)

MINERALS REFINING CO

Box 167, Murray, Utah
Gen Mgr: E F Penner
MAGIC & RAINBOW MINES, Pershing County, open pit, Au

MINERVA SCHEELITE MNG CO
Box 801, Ely
Parts: E G Stopper,
Lola V Stopper,
Martha R Allen, MD
SCHEELITE CHIEF, 90 mi SE
of Ely, undergr, WO₃
Idle
35-TON GRAV MILL, 48 mi
SE of Ely

MONOLITH PORTLAND CEMENT CO
445 S Olive St
Los Angeles 14, Calif
VP: Hugh D McBride
GOLDSFAR MINE, 25 mi SE
of Beatty, open pit, CaF₂
Supt: Charles Hoffman
PO Box 336, Beatty
(See Calif)

MORRIS, JOE C
Lovelock
SOUTHERN PACIFIC MINE,
Open pit, Fe

MORGAN & BUSH, INC
Paradise
ROBIN NO 1 CLAIM MINE,
open pit, soil conditioner

NAT'L LEAD CO
BAROID DIV
PO Box 1875, Houston 1
Texas
ROSSI MINE, Elko County, Da
TANDERS MINE, Humboldt
County, Ba
(See Ark, Calif, Colo, La, Mo,
Mont, N Y, Tenn, Tex, Utah
Wyo)

NATIONAL MERCURY CORP
11 Sandy Circle, Denver 23
Colo
Pres: Harry H Herman Jr
VP: David L Wulfsberg
Sec-Treas: Peter D Wulfsberg
FERRELL QUICKSILVER
MINE, 23 mi E of Lovelock
Antelope Springs dist, undergr
surface, Hg
Gen Mgr: Harry H Herman, Jr
Under devel

NAVAJO MINERAL FUND INC
327 S Fremont St, Las Vegas
Pres-Purch Agt: J J Satin
VP: Phillip T Asaro
Sec-Treas: Rose Satin
LUCKY JOE MINE, Iron Mt
Rd, Eagle Mt mng dist
Riverside County, Calif, open
pit, Fe
Gen Mgr: J Satin
Asst Gen Mgr: S N MacKenzie
Coal-Mat-Mine Supt:
R Sholto Douglas
Prod: Approx 500 tons per day
Under devel
500-TON-HEAV-MED MILL
Iron Mt Rd
Mill Supt: S N MacKenzie

NEVADA IRON ORE CO, INC
Lovelock
Pres: H S Thomas
VP: A H Thomas
Sec-Treas: J D Wood
BEACON HILL MINE, 25 mi E
of Lovelock, Buena Vista dist,
open pit, Fe
Gen Mgr: H S Thomas
Asst Gen Mgr: A H Thomas
Gen'l: K N Meador
Prod: 150 tons daily
(Leased from Southern Pacific
Co)

NEVADA-MASSACHUSETTS CO
Tungsten
Pres: C H Segerstrom
VP: M D Cronwell
Treas: M D Jones
Gen Mgr: E Nash
TUNGSTEN MINE, 9 mi N of
Mill City, undergr & surface
WO₃
Mine Supt: D O'Keefe
Mine Eng: Ralph Grooming
Idle
600-TON GRAV-FLOT MILL
Mill Supt: J B Caldwell

NEVADA PARK MNG CO
Box 38, Foothill Stn, Salt
Lake City 8, Utah
Sec-Treas: Richard Knight
NEVADA PARK MINE, Silver

Park Mng dist, Lincoln County,
undergr, Au, Ag
(Leased to C E Collins, Pioche)

NEVADA PORPHYRY GOLD MINES, INC
10 W 2nd St., Reno
Pres: L D Gordon
Sec: A Silver
MINE, open pit & placer, Au, Ag

KENAMETAL, INC
NEVADA SCHEELITE
CORP
430 S Main St, Fallon
Gen Mgr: E M Colwell
Asst Sec & Purch Agt:
Geraldine Marsh

Acct: Monte Leveaux
Met: Jack Frank
Mech Eng: L L Colwell
NEVADA SCHEELITE MINE,
Rawhide, undergr, WO₃
150-TON GRAV FLOT MILL, at
mine
Mill Supt: Al Schwartz

NEW PARK MNG CO
Midvale
Supt: J M Simpson
YALE GOLD MINE, undergr,
Au, Ag

NEW POTOSI MINE
Part: Peterson, G A
PO Box 135, Mina
NEW POTOSI MINE, Mineral
County, undergr, Pb, Au, Ag
Idle
Prod: 5 tons daily

PETERSON, M F & LORENA
Box 131, Tonopah
OLD COWGIRL MINE, 50 mi
NE of Tonopah, undergr, Au, Ag
Under devel
M & M (MERCURY MT) MINE
47 mi NE of Tonopah, undergr
Hg
(Optioned to Two States
Uranium Company, Bountiful
Utah)

POTTER & BAXTER
Battle Mountain
COPPER CANYON MINE,
undergr, Cu

RED ROCK MINE CO
Fish Lake Valley, Tonopah
Parts: E L Hill, Roy Puccetti,
Emory Belt, Lewis Padham,
Geo Scott
MINE, open pit, Esmeralda
County, Hg
30-TON GRAV MILL, at mine
Idle

REED & SONS
PO Box 388, Elko
BOOTSTRAP MINE, Elko
County, Au, Ag
MILL, at mine
Prod: 100 tons

RELIABLE MEAT CO, INC (LEASEE)
PO Box 608, S San Francisco,
Calif
SUMMIT CREEK MINE, Nye
Co, 75 mi N of Tonopah,
undergr, Ba
(See Calif)

REYNOLDS, ARTHUR R JR
Box 2562, Salt Lake City 10
Utah
IRON GOLD MINE, Goodsprings
Clark Co, undergr, Cu, Au, Ag
Mine Frnt: Leroy F Jacobson
Prod: 5 tons daily

RUOGLES, A L MNG CO
Cherry Creek
LAUGHING INDIAN GROUP,
3 mi S of Cherry Creek in
Egan Canyon, undergr, WO₃
Under devel
ENCHEQUEN PATENTED
MINES, Au, Ag
URANIUM CLAIMS
Telegraph mng dist
Under devel

SEGERSTROM & HEIZER
Lovelock
MINE, Pershing County, Fe

SHAW, CLARKE C
882 Humboldt St, Fallon
CAMP FARRELL GRP
Churchill County, Au, Ag

SHELTON BARITE MINES
PO Box 132, Battle Mountain
Pres: Edith L Shelton
Gen Mgr: Lawrence A Shelton
MINE, open pit, Ba
Prod: 150 tons daily
Mine Supt: Calvin E Shelton
Asst Mine Supt: Alfred C Shelton

SILICATES CORP
100 Palm Ave, San Rafael
Calif
WHITE CAPS MINE, Nye Co,
Nevada, undergr & open pit

SILVERADO MNG CO
Tucucara
MINE, undergr, Hg

J R SIMPLOT CO, MINERALS & CHEM DIV
Box 912, Pocatello, Idaho
Pres & Gen Mgr: J R Simplot
SIMPLOT IRON MINE, Carlin,
loc 28 mi S of Palisado, open
pit, Fe
Gen Mgr: O E Pothier
Idle
(See Idaho, Mont, Wyo)

SIMPLOT SILICA PRODS INC

Box 308, Overton
Pres: J R Simplot
VP: W Grant Kilbourne
Sec: Lloyd Haight
Treas: John N Dahl
MINE, open pit, Silica
Gen Mgr: Keith Madill
Asst Gen Mgr: Don Ferguson
Gen Supt: Leo Sneed
Prod: 550 tons daily
SIMPLOT IRON MINE, 26 mi
S of Palisado, open pit, Fe
Idle
550-TON GRAY MILL, at Overton
(See J R Simplot Co, Idaho
Mont, Wyo)

SISKON CORP
423 Gazette Bldg., Reno
Pres: H B Chessher, Sr
VP: H B Chessher, Jr
E J Shrader
Sec: J E Chessher

Asst Sec & Asst Treas:
A L Chadek
MAGGIE CREEK MINE, PO
Box 488, Reno, 12 Mi N of
Carlin, open pit, Cu
Gen Mgr: H B Chessher, Sr
Gen Supt: H B Chessher, Jr
Geol: Mike E Price
Met: H L Hazen
Mine Supt: M R Biswell
Under devel
(See Calif)

SOUTHWESTERN ENGINEERING CO
Pioche
Supt: C M Davis
Plant, Fe

SPAR DOME MNG CO
PO Box 108, Gabbs
Supt: Floyd J Miller
SPAR DOME MINE, 20 mi NW
of Gabbs, undergr, CaF₂
Idle

STANDARD SLAG CO
Box 3, Gabbs
Pres: L A Beaghty
VP: W E Bliss
Western Mgr: R O Jones
GREENSTONE MINE, 2 mi E
of Gabbs, surface magnesite
Supt: G B Gaylord
Frnt: A C Wood
Prod: 300 tons
300-TON GREENSTONE MILL,
Gabbs, Calcining
Frnt: W C Burnett
IRON MT MINE, Gabbs, open
pit, Fe
Prod: 700 tons
Mine Supt: M Evasovic
Idle

MINNESOTA MINE, Yerington
open pit, Fe
Prod: 1,000 tons
Supt: J R Harmon
MILL
Supt: W C Burnett
Eng-Frnt: W C Maher
(See Chia)

STAR DUST MINES, INC
#4, 383 E South Temple
Salt Lake City, Utah
Pres & Gen Mgr: Fred Cook
VP: Leslie J Baitley
Sec-Treas: W N Nance
Purch Agt: M V Cook

STAR DUST MINES, Baker,
Nevada, open pit, quartzite
Mine Supt: Fred Cook
Prod: 4 tons daily
(See Utah)

STORMY DAY MINES
435 Hillcrest Rd
San Mateo, Calif
Pres: Robert H Avery
VP: Alfred W Stroh
Sec: M J Scholz
STORMY DAY MINE,
Pershing County, undergr,
WO₃
Idle

STRODE, FRANK A & STRODE, EMERY D
Spring Valley Rt, Ely
SILVER CHIP MINE, White
Pine County, Au, Ag
Idle

SUNBURST INC
1975 N W Everett St
Portland 8, Oregon
TRADER HORN MINE, Box 908
Tonopah, Nye County, undergr,
Au, Ag
Gen Mgrs: J C Young,
Kay Critchlow
Under devel
(See Ore, Utah)

SUSIE Q MNG CO
Star Route 3, Box 32,
Las Vegas,
Sec & Eng: T E McKay
MINE,

TRIANGLE MINES CO, INC
426 Bridge St
Winnemucca
TRIANGLE MINE, 70 mi NW
of Winnemucca, Bottle Creek
dist, open pit, Hg
Supt: Harry Trollope
FLOT-MILL, at mine
Idle

TUNGSTEN MT MNG CO
311 Securities Bldg
Seattle 1, Wash
TUNGSTEN MT MINE, NE of
Fallon
Idle
(See Wash)

UNALDE LEASE
1975 Palisado Rd, Reno
Oper-Mgr: John H Unalde
ALLADIN MINE, 23 mi SW of
Elko, undergr, Pb, Ag, Cu
Under devel
BONNIE MINE, 28 mi SW of
Elko, undergr, Cu, Ag
Under devel

UNION CARBIDE NUCLEAR CO
(Division of Union Carbide
Corp)

Exploration Dept
325 E 4th St, Reno
Research Geol: H E Vitts
(See Calif, Colo, Nev, Utah,
Wyo)

UNITED PARK CITY MINES CO
Baker
Mgr: R E Tally
STAR DUST QUARRIES, open
building stone

UNITED STATES MNG & MINERALS CORP
Silver Peak
Pres: Samuel L Levine
VP: Bert H Quint
Sec: Manuel J Robbins
Treas: Florence Q Levine
Purch Agt: James Nike
OHIO MINE, Goldpoint,
undergr, Au, Ag
Mine Frnt: Harry E David
TONOPAH KING MINE,
Tonopah, undergr, Au, Ag
Mine Frnt: J Martinez
MOHAWK & NVLOC, Silver
Peak, undergr, Au, Ag
Mine Frnt: T L Kelly
Gen Mgr: J J Struvel
Gen Supt & Geol:
Donald J Beauregard
Mech Eng: Bert Carder
Met: P McGuire
Mine Supt: Robert Nelson
300-TON-CYANIDE MILL,
Silver Peak
Mill Supt: Phillip McGuire
Asst Mill Supt: Henry Albright
Assayr: Louis Warlen

U S MOLYBDENUM CO
Coaldale
MILL,
Under const
VALLEY VIEW URAN
MINING
c/o Wm Wilson, Box 888
Tonopah, Nevada
MINE, UO₃

WELLS CARGO INC
Tonopah
JUNBO BARITE MINE, 25 mi
E of Tonopah, open pit, Ba
Supt: J Cochran
(See Ariz)

WEST END CONSOLIDATED MINES CORP
Box 1147, Tonopah
Pres: F C Ninnis
VP: H D Budelman
Sec: H D Budelman
Treas: F Ninnis
WEST END MINE, undergr, Ag
Au
Gen Mgr: H D Budelman
MABEL MINE, Mina, Pb
SILVER LINING, Aurora, Au
Idle

WESTERN SILICA CO
1730 Locust Ravine
Bakersfield, California
SNOW WHITE MINE, 15 mi S
of Goldfield, undergr, silica
Supt: William Peterson,
Oakfield
WESTERN SILICA PLANT,
crushing & sizing plant
Mgr: Irving Feldcamp

WHELCH MINES CO
1019 Arthur St, Caldwell,
Idaho
Pres: William E Whelchel
VP: Ralph A Whelchel
Sec-Treas: Thressa M
Whelchel
NATIONAL MINE, McDermitt
Au, Ag
Under devel
(See Utah, Idaho)

WHITE CAPS GOLD MNG CO
317 Clay Peters Bldg
140 N Virginia, Reno
Pres: Philip Barelli
VP: Carson Frazzini
Sec-Treas: Walter Naismith
WHITE CAPS MINE, Manhattan,
Au, Sb, Hg
Gen Mgr: Hugh Cameron
Gen Supt: Cleveland Charley
Cool & Met: Albert Silver
Mine Supt: Tom Charley
Under devel

LOW BOY URANIUM MINE,
undergr & open pit, UO₃
150-TON CYAN MILL,
Manhattan

WICKNER, MILTON
6305 Yucca Street
Los Angeles
FOWLER-REEVES MINE,
Mineral & Nye Counties,
Nevada, open pit,
diatomaceous earth
Idle
MILL, Mina,
Idle

YOUNG AND CRITCHLOW
1975 N W Everett St
Portland 8, Oregon
Own: James C Young,
Kay Critchlow
COALDALE MINE, Esmeralda
County near Coaldale, undergr,
UO₃
Idle
PEERLESS SILVER & GOLD
PROPERTY, near Austin
Lander County, Au, Ag
Idle

NEW HAMPSHIRE

BON AMI MNG CO., INC
445 Park Avenue, N Y 23, NY
RUOGLES MINE, Grafton
undergr & open pit, Feldspar,
Mica, Beryl, Spodumene
Mine Supt: P B Verplanck
Prod: 50 tons daily
(See N Y)

FOOTE MINERAL CO
19 N Chilton Ave
Philadelphia 44, Pa
COLD RIVER MINE, Bellows
Falls, at Cold River, undergr,
feldspar
Gen Mgr: George Kneass, Jr
(See N C, Pa, Tenn, Va)

TRUSIAMI MNG CO
Brunswick, Maine
BERLY MOUNTAIN MINE,
Acworth, beryl & glass grad
quartz

NEW JERSEY

ALAN WOOD STEEL CO
Conshohocken, Pa
Pres: H R Wood
VP, Oper: W E Boger
Sec: A H Cashmore
Treas: J M Webb
Purch Agt: Clinton Bishop
SCRUB OAKS MINE, Mine
Hill, undergr, Fe
Supt: J P Kertus
Mine Supt: K Sherbok
Mine Frm: S J Usinowicz
Master Mech: Joseph Speicher
WASHINGTON MINE, Oxford,
undergr, Fe
Mine Supt: R M McInerney
Mine Frm: J Sadlun
Mine Eng: L Fyfe
576-TON GRAV, at mine
Mill Supt: E F Zulauf
1,272-TON GRAV-MAGNETIC
MILL, at mine
Gen Mill Frm: N K Kachner
Assayer: W P McDougal
500,000 BLAST FURNACE,
Sweedland, Fe
Supt: T J Wells, R T Flowers
(See Pa)

ALLIED CHEM CORP
(GEN CHEM DIV)
PO Box 70, Morrisstown
Pres: I H Foshee
VP: F J French
Purch Agt: J A Simpson
Mgr Mng Oper: W J Trepp
Asst Mgr Mng Oper: J R Pennington
Geol: H E Puttick
(See Colo, N Y, Va)

AMER SMELT & REFIN
CO
Barber
PERTH AMBOY PLANT
Mgr: G W Weis
Gen Supt: C B Porter
(See Ariz, Calif, Colo, Idaho,
Ill, Md, Mont, Nebr, N Mex,
N Y, Tex, Utah, Wash, &
Federal Mng & Smelting Co, Mo)

INTERNATIONAL
SMELTING & REFIN CO
25 Broadway, New York, N Y
RANTAN COPPER WORKS,
Perth Amboy, Middlesex Co
(See Ariz, N Y, Utah)

NEW JERSEY ZINC CO,
THE
180 Front St, New York 38
N Y
Pres: R L McCann
VP, Mng & Explor: S S
Goodwin
Mgr, Purch: W C Dunlap
STERLING MINES, Ogdensburg,
Zn
Supt: D McKechnie
(See Colo, Ill, N Mex, Pa,
Tenn, Va, Wisc)

BRANMOON INDUSTRIES
INC
55 Liberty St, N Y 5
MT HOPE MINE, Mt Hope,
undergr & Open pit, Magnetite
MILL, at mine
(See NY)

UNITED CLAY MINES
CORP
101 Oakland St., Trenton 6
Pres: B F Genisch
VP & Gen Mgr: G W Lee
Tech Dir: G W Phelps
Sec: K E Ward
Asst Treas: A F Quentner
Oper Mgr: W L Rider
(See Maryland, Fla, Ga,
Tenn, So C)

U S METALS REF CO
Schmid of AMER METAL
CLIMAX (INC)
61 Broadway, New York 6,
New York
Pres: Hugo de Nevillie
VP: S T Rose,
H A Vogelstein,
J Vuilleumier, J Payne, Jr
Sec & Asst Treas: E A Weil
Treas: Donald J Donatun
Dir of Purchases: D Kellner
Control: L S Cline
ELECTROLYTIC SMELTER &
REFINERY, Carteret
Gen Mgr: John Towers
Prod: 170,000 tons Cu per year
35,000,000 oz Ag per
year
800,000 oz Au per year
(See Amer Metal Climax, Inc,
NY)

NEW MEXICO

AMBROSIA LAKE URAN
CORP
Kerr-McGee Bldg
Oklahoma City 2 Okla
MINE, Ugo

AMBROSIA MINERALS
INC
763 1st National Bank Bldg
Phoenix, Ariz
LUCKY STRIKE MINE,
(See Ariz)

AMERICAN SMELTING
& REFINING CO
SOUTHWESTERN
DIVISION
813 Valley Nat'l Bank Bldg
Tucson, Arizona
Mgr: T A Snedden
Asst Mgr: A C Hall
Ch Geol: Keynon Richard
GROUND HOG UNIT
Vanadium, Fe, Mn, undergr,
Fe, Zn
Supt: L H Chapman
Mile
DEMING MLC UNIT
600-TON FLOT PLANT
Supt: L H Chapman
Mile
(See Ariz, Calif, Colo, Idaho,
Ill, Md, Mont, Nebr, N J,
N Y, Tex, Utah, Wash, &
Federal Mng & Smelting Co, Mo)

AMERICAN SULPHUR &
REFINING CO
430 N Camden Dr,
Beverly Hills Calif
MINE, Sulphurdale,
Sulphur
Under devel
MILL, at mine
Under devel
(See Calif)

AMERICAN ZINC,
LEAD & SMELTING CO
1515 Paul Brown Bldg
St Louis, Mo
KEARNEY & PEWABIC MINES,
Bayard, undergr, Zn, Pb
Gen Mgr: J W Faust
1200-TON FLOT MILL, Peru
Hill
Mill Supt: S T McBe
(Joint op with Peru Mng Co)
(See Mo)

ANACONDA COMPANY
THE, NEW MEXICO
OPERATIONS
Box 636, Grants
Mgr: A J Fitch
Asst Mgr: E C Peterson
Gen Mill Supt: W J Roberts
Met: Dale C Matthews
Mine Supt: John P Herndon
Asst Mine Supt: F J
Valentine
Geol: R D Lynn
Mech Supt: T M Fitch
Ch Chem: Jack Pate
Ch Clerk: F G Holmberg
JACKPILE MINE, open pit,
Uranium ore
Prod: 3000 tons
SECTION 33 & 9 MINES,
undergr, Uranium Ore
3,500-TON LEACHING
PRECIP MILL, Bluewater

Mill Supt: W J Roberts
(See Calif, Idaho, Mont, Nev,
N Y)

BANNER MINING CO
3042 Conner Stravenus
Tucson, Ariz
Pres: L L Travis
DONKEY-MANILA & MISER'S
CHEST MINES, Lordsburg
undergr, Cu, Ag
Gen Supt: F M Brown
450-TON FLOT MILL
Mill Supt: F E Johnson
(See Ariz)

ARTHUR BIBO
2718 Morrow Road N E
Albuquerque, New Mexico
MINE, Ugo

BLACK RANGE MNG CO
Kingston
Pres: J N Schoonmaker
VP: Pat Bradley
Sec: Ann Bradley
VIC WAGONER, LITTLE
WILLIE, BLACK JACK, RED
ROCK MINES, Wgo, Ag
DAKOTA MINE, Ugo
AZTEC & KING MIDAS MINES
Au, Ag, Pb, Wgo, Zn, Fe, Pt
20-TON FLOT MILL, Glucose,
shaker, its a new process
developed at mill,
Middle-Percha
Mill Supt: J N Schoonmaker

BLACK ROCK MNG CO
1317 North 1st Street
Grants, New Mexico
MINE, Ugo

BLUE BIRD MINE
1780 Georgia St, Silver City
Gen Mgr: R McFarland
Gen Supt: F Larido
MINE, CaF₂

BOYLES BROS DRILLING
CO
13215 Main St
Salt Lake City, Utah
MARY NO 1, ENTRADA MINES,
Grants, Ugo
(See Utah)

BRANNAN & FULLER
Box 268, Silver City
Gen Mgr: Ted Brannan
Sec Treas: Marvin Fuller
ATWOOD & HENRY CLAY
& EIGHTY-FIVE MINES, Box
546, Lordsburg, undergr, Cu
Ag, Au
Gen Mgr: Ted Brannan
Mech Eng: J M Pearson
Mine Frm: Leslie Harwell
Shift Frm: O M Mortenson
Under devel
Prod: 100 tons per day

CALUMET & HECLA,
INC
1, Calumet Ave, Calumet
MICH
VP & Gen Mgr: A S Kromer
EXPLORATION OFFICE,
Box 1600, San Mateo Rd, Grants
Party Chief: R W Kliebenstein
Geol: T A Boyden
URANIUM DIV, Box 908,
Grants,
Branch Mgr:
George McKereghan
Asst Mgr: J H Doyle
Geol: R W Weege
Mine Frm: C C Johnston
Mine Eng: R A Hays
MARQUEZ HOGBACK & #4
MINES, Ambrosia Lake
undergr, Ugo
Prod: 500 tons per day
(See Ill, Mich, N Y)

CAPITAL SEABOARD
CORP
103 E LaPlaza, Farmington
POPE NO 1 MINE, San Juan
County, Ugo

THE CIMARRON MNG CO
2424 Gaylord, Denver 3, Colo
Gen Mgr: G W Haffey
Supt: C Martinez
SAN MIGUEL MINE, Union Co,
Ca, Ag
(See Calif)

COL-U-MEX URANIUM
CORP
615 Summe Bldg, Albuquerque
Pres: Tom F Harrington
VP: Ed S Ketchum
(See Utah)

CYPRUS MINES CORP
465 Lexington Ave, New York
Pres: H T Mudd
VP: A R Thomas
VP & Treas: H S Nye
Sec: L A Garrett
Purch Agt: W F Stever
(See Ariz, Calif, Colo)

DAKOTA MINING CO
General Delivery
Monticello, Utah
MINE, Ugo

DALCO URANIUM, INC
Box 585, Grand Junction,
Utah
BARRARA J & DALCO MINES
Grants, undergr, Ugo
Mine Supt: A H Baldo
Asst Mine Supt: DW Wilson
Gen Mgr: J O'Connor
Gen Supt: A H Baldo
Prod: 50 tons daily
(See Colo)

DOOLEY BROS PUMICE
INC
709 Tulane Dr, NE
Albuquerque
Pres: G L Dooley
VP: J R Dooley
Sec: M Dooley
Treas: J M Dooley
DOOLEY PHOS MINE, James
Mie 4 of Domingo open pit,
pumice
Prod: 600 tons daily
600-TON CRUSHING &
GRADING MILL, Domingo
pumice

D & R MINING CO
PO Box 113, Socorro
Partnership: Dwyer Min Corp
& W B Rogers
HECKY & DELIGHT MINES,
Cu, Ag
Gen Mgr & Mine Supt:
W B Rogers
Gen Supt: Carl E Dotson
Prod: 10 tons daily

DUVAL SULPHUR &
POTASH CO, POTASH
DIV
Box 510, Carlsbad
Res Mgr: F E Tong
Asst Res Mgr: J W Borskey
Ch Eng: B F McGuire
Safety Eng: E C Childers
Purch Agt: J P Seaton
MINE, 21 mi NE of Carlsbad
undergr, potash
Prod: 1,000 tons
Mine Supt: R H Taylor
Mine Frm: J J Gasparich
Mine Eng: H L Shively
FLOT MILL
Mill Supt: M H Harrison
Mill Frm: W M Bourn
(See Ariz, Tenn)

EL PASO MINERALS CO
Box 306, Truth or Consequence
SHANDY PLACER MINE, Au
Mgr: G E McKenzie

ENTRADA CORP
618 Sims Bldg, Albuquerque
Pres: F W Connolly
VP: A A Hunt
Sec & Treas: Mary C Connolly
MARY #1 MINE, undergr, Ugo
Prod approx 500 tons daily

FARM CHEMICAL
RESOURCES DEVEL
CORP
Box 1, Canal St, PO Box
888, Carlsbad
Pres & Gen Mgr:
E F Kindsvater
VP: G J Tashert, D A McGee
Sec: C F Brannan
Treas: W H Rahm
Purch Agt: W G Hensley
(acting)
Chmn of Bd: J G Patton
POTASH MINE, Eddy & Lea
Counties near Arivaca
Under devel
(Joint venture of Kerr McGee,
Phillips Petroleum Co and
Nat'l Farmers Union)

FARRIS MINES
Box 667, Grants
VALLEJO INCLINE MINE,
Ugo
Gen Mgr: Q R Farris

FEBCO MINES
PO Box 687, Grants
SILVER SPUN MINE, Ugo

FEDERAL URANIUM
CORP
1370 S 3rd West,
Salt Lake City, Utah
HAYSTACK BUTTE MINE,
McKinley Co, Ugo
(See Idaho, Utah)

FLAT TOP MINING CO
801 Court Street
Scam City, Kansas
MINE, Ugo

FOUR CORNERS
EXPLORATION CO
Box 116, Grants
Gen Mgr: Irving Rapaport
Geol: Forrest Fincher
Gen Supt: L D Barry
DOG, MOGAB & MALPAIS
MINES, McKinley County,
undergr, Ugo

FRANCES MINERAL
RESOURCES CO, INC
Box 38, La Madra
FRANCES RED MINE, Mica
Gen Mgr & Sec: E A Telecky

GENERAL MNG & MLLG
CORP OF COLO
833 E Platte Ave, Colo
Springs, Colo
HANLE TT NO 1 & 2 MINES,
Grant County, Fe
(See Colo)

GIBRALTAR MINERALS
CO
Box 66, Hachita
Pres: Harold Hinn
VP: Harry Riggs
HORNETT & AMERICAN MINES,
Hachita, undergr, Pb, Ag
Mgr: Charles G Gardner
Mine Frm: G Ortega
Under devel
Prod: 50 tons per day
800-TON FLOT MILL
(See Tex)

GREAT LAKES CARBON
CORP, MINING &
MINERALS PROD DIV
PERLITE DEPT
Box X, Socorro
BLANCA VISTA MINE, 4 mi W
of Socorro, surface, perlite
Ch Geol: J R Reinhart
MILL, Socorro
Mill Supt: A K Muir
(See Calif, Colo, Mont, Nev, Oreg)

GREAT WESTERN
MINERALS
498 E Allen Ave,
Monahans, Tex
BLACK COLT MINE, Hillsboro,
N Mex, Ag
Mine Frm: R Tiley

HAPMAC MNG CO
7045 Green Tree Lane
Dallas 16, Tex
FLAT TOP NO 1 MINE,
McKinley Co, Ugo

HAYSTACK MT DEVEL
CO, (A SUBSID OF
SANTA FE RY CO)
80 F Jackson Blvd
Pres: E S Marsh
VP: R G Rydin
Sec Treas: C A Menninger
Purch Agt: F J Steinberger
HAYSTACK & POISON CANYON
MINES, Preelit, open pit,
undergr, Ugo, Vgo
Gen Mgr: Ch Mng Eng:
T O Evans

Gen Supt: L G Fuller
Prod: 200 tons
SECTION 23 13-10 & SECTION
25-13-10 MINES, McKinley
County, Ugo
Mine Supt: L G Fuller
Asst Mine Supt: R Gonthieb

HIDDEN SPLENDOR MNG
CO, THE
1st Security Bldg
Salt Lake City, Utah
SAN MATEO DOME
PROPERTIES, Ambrosia Lake
Area, Ugo
(See Colo, Mont, Utah, Wyo)

HOMESTAKE-NEW
MEXICO PARTNERS
PO Box 268, Grants
(Gen Part: Homestake Mng Co
Limited Partners, United
Western Minerals Co,
J H Whitney & Co; White
Weld & Co; Hidden Splendor
Mng Co; San Jacinto

Petroleum Co; Clyde Osborn)
SECTION 23 MINE, undergr
Ambrosia Lake, UOg

Mine Engr: R Steele
Mine Frmt: L Stubbelfield
Gen Mgr: Clyde Osborn
Met: F N Oberg
Prod: 300 tons daily
550 - TON CARBONATE LEACH
PLANT, 8 mi NW of Grants
Supt: Clyde Garman
Asst Supt: Homer Derr
Sampling Plant & Yard Frmt:
Robt W Strammiller
Plant Met: Fred N Oberg
Ch Chem: John R Wesley
Control Eng: Harvey O Bird
Elec Frmt: B W Brown
Mech Frmt: Royce M Bricker
(See Homestake Mng Co, Calif,
S D, Utah, Wyo)

HOMESTAKE-BAPIN

FARMERS
Box 84, Grants
Mgr: L W Sweet
SECTION 15, 23, & 25 mines,
Grants, undergr, UOg
Supt: D T Delicate
Frmt: G A McMillan
Eng: E A Graber
Prod: 1850 tons
1,650-TON MILL, Grants, UOg
Supt: F M Howell
Asst Supt: J Q Jones
Assayer: A N Jones
(See Homestake Mng Co, Calif,
S D, Utah, Wyo, also Sabre-
Pinon Corp - N Mex)

INTERNAT'L MINERALS

& CHEM CORP

AGRI CHEMICAL DIV

3401 Old Orchard Rd, Shokie,
Ill

CARLSBAD POTASH MINE,

Box 71, Carlsbad, undergr,
KCJ & K504

Opres Mgr: E C Skinner
Geol: R Hougland
Mech Eng: Paul Wright
Mine Supt: M W Karchner
Mine Eng: Adolph Mitterer
Prod: 13,000 tons
14,600-TON FLOT MILL, at
mine

(See Ariz, Fla, Ill, Maine, Miss,
NC, SD, Tenn, Va, Wyo)

INTERNATIONAL

URANIUM CORP

Rt 1, Box 1524, Clark Rd
Albuquerque

Pres: C Taylor
Gen Mgr: P Taylor
BELVIDERE MINE, Co, Au, Pt

J & W MNG CO, INC

Box 762, Lordsburg
SUSIE & SUSIE NO 2 MINES,
Ag, Cu

Supt: R B Hurley
Gen Mgr: J M Barevitz

JOHNS-MANVILLE

PERLITE CORP

504 Railroad St, Joliet, Ill

NO AGUA MINE, Teas
County Perlite

K & N COMPANY, INC

PO Box 337, Grants

Pres: R C Kirchman
MINE, UOg

KENNECOTT COPPER

CORP CHINO MINES DIV

Hurley
Gen Mgr: E A Slover
Dev Purch Agt: C N Dempsey
CHINO MINES, Santa Rita, open
pit, undergr, Co, Mo6

Mine Supt: J M Halvina
Ft Supt: W E Horkenoff
Maint Supt: D C Thorne
Mine Eng: H A Wilmoth
FLOT MILL, Hurley
Mill Supt: F D Thayer
Maint Supt: M M McGee
REVEREND SMELTER, Hurley
Supt: W C Dow
REDUCTION PLANT
Maint Supt: M M McGee
(See Ariz, Nev, N Y, Utah)

KENNEDY & MCGEE MNG

CO

5 Red Rock Trading Post
Shiprock

FLOT NO 7 MINE, UOg, V2O5
Gen Mgr: J S McGee

KERMAC NUCLEAR

FUELS CORP

(Owned by Kerr-McGee Oil
Industries, Inc; Pacific

Uranium Mines Corp, Los
Angeles, Calif, Anderson
Development Co, Albuquerque
N Mex)

PO Box 218, Grants

Pres: D A McGee
Exec VP: George H Cobb
Sec-Treas: P A Puttloff
VP & Gen Mgr: M F Bolton
Maint Mgr: Baxter Blitt
Explor Mgr: E E Jones
Purch Agt: G A Ruster
6 MINES, Ambrosia Lake,
undergr, UOg

Prod: 3300 tons daily
Mgr of Mines: H E Nelems
Div Mine Mgr: Ray Jenkins
Mine Geol: F C Holne
2,300-TON MILL, KON-
EXCHANGE, Ambrosia Lake
Mgr: H R Keil
Met: R J Woody
Supt: D O Carlson
(See Kerr-McGee, N Mex)

KERR-MCGEE OIL IND,

INC, NAVAJO URANIUM

DIV

PO Box 608, Shiprock
Gen Mgr: C L Wise
SOLVENT EXTRACTION MILL,
Shiprock

Ch Met: M N Shaw
Gen Frmt: Al Cynova
Ch Chem: A MacAllister
Maint Supt: T E Kyle
Plant Eng: John Shive
(See Ariz, Colo, Okla, Wyo,
& Kermac Nuclear Fuels,
N Mex)

LANCE CORP

Box 187, Grants
BLACK JACK #1 & 2 MINES,
Smith Lake, undergr, UOg
(Subsidiary of Sabre-Pinon Corp
Santa Fe, N Mex)

LARGO URANIUM CORP

(Subsidiary of Four Corners Oil &
Minerals Co, Denver Colo)

1700 Broadway
Denver 2, Colorado

Pres: E H Sanders
VP: Edw L Clark
Gen Mgr: Wesley Smith
LARGO NO 2 MINE,
815 E Morgan, Gallup, undergr,
UOg, V2O5
(See Four Corners Oil & Mine
Co)

(See Colo, Utah, Wyo)

LEACH, ALBERT A

PO Box U, Lordsburg
Own: Albert A Leach
LADY FRANKLIN GROUP, Ag
Au, Mn
COLOSSAL-MIDNIGHT, Co, Au
Ag
RESERVATION-MINNEAPOLIS,
Au, Ag, Pb
ALHAMBRA GROUP, UOg,
Ag, Bi, Co
ALASKA GROUP, GOLDEN
LINK GROUP, MALONE GROUP
Au, Ag
Producing
FLOYD COLLINS GROUP,
White Signal dist, Grant
County, UOg

LONE STAR MNG &

DEVEL CORP

235 Korver Bldg,
Albuquerque

Pres: W L Davis
SANTA FE CANYON MINE,
UOg

LUBBOCK MNG CO

Gen Del, Lordsburg
HAPPY PROMISE NO 1 & 2
Cu, Au, Ag
Supt: C Wilkins

LUCK MNG CO

315 Market St, San Francisco 5
California

BOSTON HILL MINE, Box 29,
Silver City, Pa, Mn
Mgr: J F Hutchins
(See Calif)

LÜMMUS, R H &

HOLMES, C E

Box 7131, Indwood Station
Dallas 9, Tex

BIG CHIEF NO 4 MINE, UOg,
Socorro Co, N Mex

JAMES MCGREGOR & CO

Box T, Tyrone
Gen Mgr: J McGregor
ALHAMBRA MINE, Au, Ag

MCKEDY MNG &

EXPLORATION CO

Box 1002, Socorro

Pres: Edw H McKedy
MCKEDY #1, Poncho &
Richard Mines, UOg

MIDNIGHT #2 MINE, Ag
Cu, Pb

MATHIS & MATHIS

PO Box 452, Silver City

IRON HEAD CLAIM & PEARSON
PIT, Near Fierro, Fe

MID CONTINENT

EXPLO CO

826 Bankers Mortgage Bldg
Houston, Texas

MINE, UOg

MID CONTINENT MNG

CO

PO Box 494, Grants

MINE, UOg
(Jt opr with Rio De Oro, New
Mex)

MID CONTINENT URAN

201 Uranium Center Bldg
Grand Junction, Colo

MINE, UOg

MINERAL RESOURCES

CO, INC

Box 38, La Madera

FRANCIS MNG CLAIM MINE,
Pegmatites

MINERS DREAM

Box 4, Hillsboro

MINE, Au, Cu, Ag, Au, Zn
Mgr: E Richardson

MOE, E P

PO Box 388, Grants

Sec: Louise Lowery
MINE, 16 mi NW of Grants,
undergr, UOg, V2O5
Gen Mgr: E P Moe
Gen Mgr & Mine Supt: C C
Kugel
Under devel

MOLYBDENUM CORP OF

AMERICA

Quetta

Pres: Max Hirsch
VP: E A Lucas
Treas: Wm B Kuntz
Gen Mgr: A L Greslin
MOLY MINE, 7 mi E of Quetta
undergr, Mo
Supt: Jose Varela
Under devel

300-TON FLOT MILL
Supt: Robert Creel
Idle
(See Calif, Colo, N Y, Pa)

MONTGOMERY, ARTHUR

Dixon

HARDING MINE, Pegmatites

MULLER MANGANESE

Box 705, Wilcox, Arizona

AMERICAN 39 MINE, LUNA CO,
N Mex, Mn
(See Ariz)

NATIONAL POTASH CO

PO Box 731, Carlsbad

MINE, 30 mi E of Carlsbad
undergr, Potash
Gen Mgr: T G Ferguson
Asst Gen Mgr: G L Jordan
Elec Eng: D F Parker
Ch Process Eng: R M Fisher
Mine Supt: C E Groeso
Mine Eng: R E Billman
4800-TON FLOT MILL, at
mine
Mill Supt: R J Ferrante
(See N Y)

NEW JERSEY ZINC CO

180 Front St, N Y, N Y

VP, Mng & Explor:
S S Goodwin
Sec-Treas: Samuel Riker Jr
EMPIRE ZINC DIV, Hanover,
undergr, Zn, Pb
Supt: R A Winslow
(See Colo, Ill, N J, N Y, Pa,
Tenn, Va, Wisc)

NEW MEXICO THORIUM

CORP

Box 3, Carlsbad

PINE MINE, Th
Gen Mgr: A J Weisig, Jr
MEX-TEX MINE, Pb, Ba, Ag
Gen Mgr: L Downey

ORE REDUCTION CO

Box 532, Lordsburg

Pres: J E James

3774 Sunset Blvd

Houston, Texas

Clyde Wilkins, Lease mines

SMELTER, 6 mi W Lordsburg

Supt: A C James

OZARK-MAHONING CO

MNG DIV

310 West Sixth St, Tulsa 19
Okla

MINES, CaF2
(See Colo, Ill, Okla)

PACIFIC URANIUM

MINES INC

1924 White, Grand Junction
Colorado

Pres: Dr M O Hassallia
VP: H E Roberts
Sec-Treas: I Klubok
SECTION 24 & 26 MINES
Ambrosia Lake Dist, UOg
Mgr: R L Redmond
Geol: J H Volgamore, Jr
Co. Rep. Res Eng: R O'Brien
Prod: 1,000 tons
(Managed by Kermac Nuclear
Corp, Grants)
(See Colo)

PATTEN & GALASSINI

Box 205, Bayard

Part: L A Patten,
Gene Galassini
LYNCHBURG AND
CONTINENTAL "A" MINE,
Grant County, Pb, Zn, Cu,
undergr

PELTON, CLYDE V

PO Box 422, Carlsbad

MINE, Hudspeth County, Tex,
Talc, Soapstone
(See Tex)

PEOPLES CARALAN CO

Peoples State Bank,
Ellenwood, Kans

LITTLE ROCK MINE, Grant
Co, N Mex, Cu
(See Kans)

PERLITE INDUSTRIES,

INC

Box 216, Terminal, Tex

Gen Mgr: G E Stone
HELLAMEA MINE, Grant Co,
Perlite

PERU MNG CO

Box 300, Silver City

Pres: Fred M Zeder II
VP: J H Taylor
Sec: A R Bothe
KEARNEY & PEWAUIC MINES,
Bayard, undergr, Zn, Pb, Ag
Gen Mgr: J W Faust
1200-TON FLOT MILL, Peru
Hill
Mill Supt: S T McHee
(Jnt Opr with American Zinc,
Lead & Smelting Co, N Mex)

PHELPS DODGE CORP

Tyrone

BURHO MT BRANCH
Explor
COPPER & RACKET MINE,
Grant County, Cu
(See Ariz, N Y, Tex)

PHILLIPS PETROLEUM

CO

Box 36, Grants

ANN LEE, SANDSTONE, DORS,
FAITH, ISABELLA, CHURCH-
ROCK & CLIFFSIDE MINES,
McKinley County, undergr,
UOg
Dist Mgr: A A Ruoho
Asst Mgr-Adm: G E Karr
Maint Supt: C W Gregory
Supt of Mines, H F Haller,
R M Caywood and R F Moe
Dist Geol: D C Arnold, Grants;
Dean Clark, Gallup
Mine Eng: C E Doney
1725-TON MILL, McKinley
County
Mill Supt: W O Bice
Process Supt: J W Garner
Tech Supt: J B Owen
Met: H E Damm
Maint Supt: G W Robinson
Ch Chem: F C Haas
(See Okla, Utah)

PHILPOTT, C H

Lincoln

HEADACHE MINE, Cu

PICKENS, CHARLES N

Mancos, Colo

KING TUTT NO 1 MINE, San
Juan County, UOg

POTASH CO OF

AMERICA

Box 31, Carlsbad

Pres: John W Hall
VP & Asst Gen Mgr: H N Clark
Treas: W H Bartlett
Purch Agt: A H Boidel
Ind Rel Supt: R H Blackman, Jr
MINE, 21 mi NE of Carlsbad,
undergr, KCl
Plant Eng: R E Doherty
Safety Eng: P F Holstein
Gen Supt: R R Knill
Mine Supt: David Rice
Mine Eng: E C Jordan
Prod: 8,000 tons
8,000-TON FLOT MILL, at
mine
Mill Supt: R E Smith
Asst Mill Supt: P S Jack

RAINBOWS END MNG CO

Box 349, Silver City

MINE, Cu
Supt: G A Huff

RAE METALS CORP OF

AMEN

1st Security Bldg, Salt Lake
City, Utah

Pres: C L Perkins
VP & Asst Gen Mgr: M H Kline
Sec-Treas: Virgil Hittman
SAN MATEO & SPURRIER TRACH
MINE, Ambrosia Lake Dist,
Valencia & McKinley Counties,
undergr, UOg
Mine Supt: J J Snider
(See Ariz, Idaho, Utah)

REAGAN-BAILEY

EXPLORATIONS

PO Box 1078, Lordsburg

Co-own & Engr: Leslie J.
Reagan

Co-own & Engr Mgr:
John C Bailey
JEEP, BOBCAT, COCHISE,
DOS AMIGOS MINES, undergr,
Au, Ag, Pb
JAR, Catalina 26 MINES, open
pit, Th, Hare Ent, Garnierite
Idle

REX URANIUM CORP

Box 1338, Farmington

Pres: R J Canlon
VP: J H Colbert
Sec: John R Mendius
(See Colo)

RIALTO MNG CO

Box 2348, Milan Sta, Grants

CHILL WILLS 1 SHAFT MINE,
UOg

RIMROCK MNG CO

7045 Green Tree Lane,
Dallas, Tex

ROUNDY LEASE & T-20 MINES,
McKinley County, UOg

RIO DE ORO URANIUM

MINES, INC

3th Silver, PO Box 997,
Albuquerque

Pres: W R De Villiers
VP: Ray Schultze
Sec: R F D Arledge
Purch Agt: P Blair
DYSART NO 1 MINE, Box
484, Grants, undergr, UOg
Gen Mgr: R Schultze
Gen Supt: D Turberville
Geol: Harold Powers
Elec Eng: August Witsensky
Mine Supt: Dave Turberville
Mine Frmt: Marshall Fletcher
Mine Eng: Joe Crank
DYSART NO 2, under devel
(Jt Opr with MID CONTINENT
MNG CO, N Mex)

CLAUDE ROBINSON

GRADING CO

Box 1638, Borger, Texas

MANGANESE CHIEF MINE,
Socorro Co, Mn
Mgr: W H Harder

ST ANTHONY URANIUM

CORP

Box 1789, Grand Junction
Colorado

Gen Mgr: A M Mastrovich
M-4 SHAFT, Valencia County,
undergr, UOg
Gen Supt: Edward Matson
(See Colo)

SABRE-PINON CORP

PO Box 1537, Belton Bldg
Santa Fe

Pres: Richard D Bokum, II
VP: R Montgomery

See: W L Lewis
Treas: Hugh M Craigie
BLACK JACK #1 MINE, undergr.
 UG₀, Smith Lake
Gen Mgr: Paul Melancon
Gen Supt: Win Buchecker
Mech Eng: Dale Hatcher
Prod: 1000 tons daily
BLACK JACK #2 MINE,
 undergr., UG₀
 Under devel

(Operated by Lanco Corp)
 MILL

(See Homestake-Sagin Part,
 N Mex, also Homestake Mng Co,
 Calif, S Dak, Utah & Wyo)

SAMSON OIL & MINERAL
 CO

Fl Worth, Texas
 MINE, UG₀

SCARTACCINI, TOM B
 430 Amberst, N E,
 Albuquerque

SAN PEDRO MINE, Co, Ariz
 Ad

SEE-TEE MNG CORP

314 3rd NW, Albuquerque
Pres-Treas: A H McRae
Sec: Paul B Young
Oper Mgr: Harry Anderson
BUCKY #1, Sec 14, Ambrosia
 Lake, Grants
MESA TOP, MALPAIS,
BEACON HILL, HOGBACK #4,
LUCKY DON & SILVER SPUR,
 NO 1 MINES, Sec 20, McKinley
 County, undergr., UG₀
Prod: 175 tons combined
Gen Mgr: Thomas P Fife

SHIPROCK INDUSTRIES
 INC

8000 National Bank of Tulsa
 Bldg, Tulsa 3, Oklahoma
Pres: Lee Huey
V.P. Sales: W Stalheim
SANOSTEE MINE, Chuska Mts
 near Sanostee, undergr., UG₀,
 UG₀
Gen Mgr: Nels W Stalheim
Gen Supt: Shannon A Fowler
Mine Supt: Stanley J Fowler
 (See Colo)

SOCORRO URANIUM CORP

810 Oil & Gas Bldg, Wichita
 Falls, Texas

JETER MINE, Socorro County,
 UG₀

SOUTHERN & CALAHAN

8100 San Mateo Rd, Grants
 N Mex

PARROT MINE, San Miguel Co,
 UG₀

(See N Mex)

SOUTHWEST POTASH

CORP (Subdiv of AMERICAN
 METALS CLIMAX, INC)

61 Broadway, New York 6, NY

MINE, Box 472, Carlsbad

25 mi NE of Carlsbad, undergr.
 potash

Gen Mgr: Victor A Zambora

Mech Charles Abernathy

Purch Agt: E W Brooks

Asst Gen Supt: John Bowers

Mine Supt: Lloyd Foulkes

Gen Mine Supt: Lloyd Foulkes

5000-FLOR MILL, at mine

(See American Metal Climax Co,
 Inc, NY)

STAR MINES

608 W 12th St, Silver City

Pres & Gen Mgr: David D Osmer

MORNING STAR MINE, undergr.,
 placer, Wyo, BI

Mine Supt: Louis L Osmer, Jr

24-TON GRAY MILL, at
 mine

SUNSHINE MNG CO

Box 733, Socorro

BLANCHARD PROPERTY MINE,
 Ph, Ba, Florite

Project Mgr: E F Elstone

Mgr of Mines: J Edgar

(See Idaho, Wash)

LLOYD O SUTTON

Grants
 MINE, UG₀

TATE MINE DEVEL &

SUPPLY CO

3436 N Kelvin Blvd,
 Tucson, Ariz

RED HILL EXTENSION MINE,
 Box 171, Socorro
 (See Ariz)

TEXAS MANGANESE CO

Box 3074, Lubbock, Tex

BLACKIE MINE, Truist of
 Consequence, Mn

Mgr: Doyle Seal

THREE BELLS MNG &

MLO CO

Box 1075, Lordsburg

Pres: L J Reagan

VP: J C Bailey

Treas: Joan Reagan

SPANISH MINES PROJECT, II
 mi NE of Lordsburg, undergr.,
 As, Ag, Pb

Gen Mgr & Purch Agt:
 L J Reagan

Gen Supt: J C Bailey

Prod: 35 tons

Under devel

80-TON GRAY CYANIDE MILL,
 at mine

TILTING FURNACE, at mine,
 Supt: J C Bailey

UNITED PERLITE CORP

(Partially owned subd of
 United Western Minerals Co)

136 W Palace Ave, Santa Fe

Pres: E J James

Treas: J R Davis

Gen Supt: F D Waltham

Sale Mgr: W S McKay

MINE, 6 mi N, 15 mi E, Tres
 Piedras, open pit, perlite

Prod: 150 tons per day

Mine Supt: Lester Sibley

800-TON-CRUSHING,
 SCREENING & DRYING MILL,
 RAILROAD LOADING

FACILITIES, Antonito, Colo

U S BORAX & CHEMICAL
CORP, U S POTASH CO

DIV

Carlsbad

Res Mgr: Earl H Miller

Asst to Res Mgr: D L Libbey

Purch Agt: A P Simons

MINE & REFINERY, 21 mi E
 of Carlsbad, potash

Field Supt: John S Wright

Mine Supt: J C Horne

Refinery Supt: L A Tillotson

(See Calif, NY)

U S SMELTING,
 REFINING & MINING CO

PO Box 666, Bayard

MINE, Ph, Zn

Supt: G E Cudney

FLOT MILL

Gen Mill Frm: Gordon T Glover

(See Alaska, Ariz, Mass, Utah)

UNITED WESTERN

MINERALS CO

303 E Palace Ave, Santa Fe

Pres-Treas: Leland Thompson,

Jr

VP-Treas: E D White, Jr

SEC 22, T-14N, R-9W,
 Ambrosia Lake, undergr., UG₀

Prod: 250 tons per day

(This section is dedicated to
 Homestake-New Mexico
 Partners)

SEC 8, T-13N, R-9W
 Ambrosia Lake, undergr., UG₀

(Jointly owned by United
 Western Minerals Co, J H
 Whitney & Co, White Weld & Co,
 San Jacinto Petrol Corp)

SEC 22, T-14N, R-10W,
 Ambrosia Lake, undergr., UG₀

Prod: 1000 tons per day

Ops, Kermac Nuclear Fuels,
 Inc

(Jointly owned by Kerr-McGee Oil
 Ind, United Western Minerals
 Co, J H Whitney & Co, White
 Weld & Co, San Jacinto Petrol
 Corp)

SEC 14, T-13N, R-9W,
 Ambrosia Lake, undergr., UG₀

Prod: 300 tons per day
 (starting first quarter 1959)

Op: Four Corners Exploration Co
 (Jointly owned by Four Corners
 Explor Co, United Western
 Minerals Co, J H Whitney & Co,
 San Jacinto Petrol Corp)

SEC 36, T-14N, R-10W,
 Ambrosia Lake, undergr., UG₀

SEC 28, (E 1/2) T-14N, R-10W,
 Ambrosia Lake, undergr., UG₀

Drilled out orebody of
 undetermined tonnage

Op: Phillips Petrol

(Jointly owned by Phillips Petrol,
 United Western Minerals Co,
 et al)

750-TON CARBONATE LEACH
PLANT, near Grants

(Jointly owned by Homestake-
 New Mexico Partners)

Gen Supt: Clyde Osborn

U S GYPSUM CO

Box 316, Grants

Works Mgr: E J Wilson

US GYPSUM PERLITE MINE,
 Perlite

VALLEJO URANIUM

MINES, INC

Box 667, Grants

DOUBLE J MINE, U₃O₈

VANADIUM CORP OF

AMER

430 Lexington Ave

New York, NY

SEC 35 MINES, McKinley
 County, UG₀, V₂O₅

Mine Frm: Abe Day

(See Ariz, Colo, N Y)

VERMILION CLIFFS

MNG CORP

Box 1437, Flagstaff, Ariz

Pres: C E Knowles

VP: R E Darling

Sec-Treas & VP of Oper:
 Allen C Tester

SLATE, SILVER KING & RIO
GRANDE MINES, Bayard dist,
 N Mex, undergr., Ph, Zn

Mine & Gen Supt: Ray Holmquist

Mine Frm: Urbano Chaco

Ida

VIA DEVELOPMENT

CORP

Box 4395, Santa Fe

Pres: Clarence W Via

VP: H H Via

Sec-Treas: W Dale Trieler

(See Ariz)

VOGEL MINE & EXPLOR

CO

Box 3183, Amarillo, Texas

Gen Mgr: Harold W Vogel

MRKIE V NO 2, 3, 7 MINES,
 San Miguel County, open pit,

Tecolote Mng Dist, UG₀

V₂O₅, Cu

Asst Gen Mgr: Harold H Ham

Under devel

(See Colo)

W C T ENGINEERING CO

PO Box 113, Bolon

MINE, McKinley Co, UG₀

(See Utah)

WERNER LAKE NICKEL

MINES LTD

311-300 Bay St, Toronto, Ont,

Canada

Pres: R C C Henson

VP: G D Clarke

Sec-Treas: G E Kennedy

HENRY CLAY MINE, PO
 Box 545, Lordsburg, undergr.,
 Cu, Au, Ag

Gen Mgr: Murray Watts

(Under sub lease to Brandon &
 Fuller, Silver City)

WESTWATER CORP

Radio Plaza, Santa Fe

Pres: C C Green, Jr

VP: J E Brosseau

Sec & Treas: E P Philby

WESTWATER #1 MINE, Sec 2
 T 19N R 16W, McKinley County
 UG₀, V₂O₅

Mine Supt: James H Mallory

Mine Frm: Dixon Weigert

Prod: 20 tons daily

WHITE STAR MINES

Box 565, Columbus

MINE

Mine Supt: Boyce Cook

WILLIAMS' MNG

PARTNERSHIP

Uraniun Center Bldg, Grand
 Junction, Colo

BARBARA J #3 MINE, Grants
 UG₀

Prod: 100 tons daily

(Leased from Mid-Continent
 Uranium Corp; See Colo)

ZUNIGA MINES, INC

Box 601, Silver City

Pres: Douglas B White

VP: Earl Strong

Sec-Treas: Frank Light

ZUNIGA MINE, Near Flerro,
 Grant County, surface, Cu

Prod: 100 tons

LEACHING MILL, at mine

NEW YORK

AMER AGRI CHEM CO,
 THE

100 Church St, New York 7

Pres: C M Powell

VP: R B Richey

VP, Prod: D S Parkham

VP, Fert. Sales: W S

Turberville, Jr

VP, Chem Sales: R R George

Sec & Treas: Hughes Mayo

Comptroller: W H Hildebrandt

Purch Agt: G E Campbell

(See Fla)

AMERICAN CYANAMID
CO

30 Rockefeller Plaza,

New York 20

Pres: W G Malcolm

VP: R B Fluke, Ed Powers,

R C Swain, G R Martin

S C Moody, L C Perkins

A C McAllister, A B Cline

K H Kipatnick, R O Robin

Treas: G C Walker

Sec: R S Kyles

(See Ark, Fla, Co, Va)

ALLIED CHEM CORP

(Mng Dept)

GOLDFIELDS AMERICAN DEVELOPMENT, LTD
123 Williams St, New York 20
Exec VP: R F Player
VP-Mng: V C Allen
VP-Finance: J H Nicholas

GOUVERNEUR TALC CO, INC

c/o R T Vanderbilt Co
230 Park Ave, N.Y. 17
Pres: F B Vanderbilt
Sec: H B Vanderbilt
Treas: C C Gens
Purch Agt: K J Miles
VANDERBILT MINE, Balmat, undergr, talc
VP & Gen Mgr: R S McClellan
Mine Supt: J Bulgar
Frm: Leon Typhair
Mine Eng: Geo Erdman
Prod: 400 tons
500-TON DRY GRIND PLANT
Mill Supt: Howard Adam

HOLLY CORP
408 Lexington Ave, N.Y. 17
Pres-Treas: S B Harris, Jr
VP: C Chinasso
Sec: T J Glynn
Compt: J T Murray
(See Mich)

HOWE SOUND CO
500 Fifth Ave, New York 36
Pres: William M Weaver, Jr
VP: F A McGonigle
W T Holmes, L C Milliken
Sec: C N Skinner
Treas: J F Willmott
(See Massachusetts, Inc, Nev)

IDARADO MNG CO
360 Park Avenue, New York
(See Colo)

INDUSTRIES & MINES INC

85 Broad St, New York 4
Pres-Purch Agt: Martin Lasher
VP: William Scott
Sec: P V Frankel
Treas: M Greenman
(See Utah)

INSPIRATION CONSOL COPPER CO

25 Broadway, New York 4
Pres: H M Jacob
Sec-Treas: E F Wendt
Purch Agt: D Harris
(See Ariz)

INTERNAT'L SALT CO, INC

NETSOF MINE, 4 mi S of
Geseoco, undergr, rock salt
Gen Mgr: Stanley Martin
Purch Agt: J A Cooney
Pl Eng: R Goss
Elec Eng: D L Wynne
Prod Supt: J J Riordan
Mine Supt: Lawrence Teier
Asst Mine Supt: Lewis Bush
Mine Eng: Chester Truax, Jr
Prod: 4000 tons
(See La, Mich, Pa.)

INTERNATIONAL SMELTING & REFINING CO

25 Broadway, N.Y.
(See Ariz, N.J., Utah)

INTERNAT'L TALC CO, INC

Box 208, Gouverneur
Pres: R H McCarthy
VP: T H Bourke
VP-Sec: S F Tuttle
Treas: P F McCarthy
Purch Agt: A P Loomis
INTERNATIONAL MINE,
Gouverneur, talc
VP-Gen Mgr: P G Kushi
Mine Supt: David Crawford
Asst Mine Supt: Peter Rocce
Mill Supt: C F Diendorf
Prod: 400 tons per day

JOHNS-MANVILLE SALES CORP

22 E 40th St, New York 18
Pres: C B Burnett
VP for Prod: K W Huffine
Sec: H M Ball
Treas: J M Shackelford
Purch Agt: D H Lyons
(See Johns-Manville Products Corp, Calif)

JONES & LAUGHLIN STEEL CORP, NEW YORK ORE DIV

Star Lake
DENSON MINES, 32 mi E of

Gouverneur, open pit, Fe
Mgt: R G Fleck
Asst Mgt: A F Peterson, Jr &
M O Peterson
Ch Mng Eng: E M Smoby
Pl Met: E A Eastman
Res Eng: Carl Djovich
Ch Asst: A R Reinbach
Geol: P J West
Ind Eng: F E Woodworth, Jr
Gen Frm, Pitt W P Bach
Gen Frm, Conc: W A Vickers
Gen Frm, Sinter: R W West
Gen Frm, Main: P L VerSteeg
Ch Elec: R F Peterson
Safety Supt: C LaDuc
Prod: 15,000 tons crude

5,000 tons concentrate
GRAY & MAGNETIC SEPARATOR MILL, at mine
SINTER PLANT, at mine
(See Mich, Minn, Pa)

KENNECOTT COPPER CORP

161 E 42nd St, New York 17
Pres: C R Cox
Exec VP: F H Milliken
VP, Explor: James Boyd
(Bear Creek Mng Co)
VP, Research: Leslie G
Jenness
Sec: Paul B Jessup
Treas: E S Hann
Compt: G B Russell
Dir, Eng: M D Myers
Dir, Ind & Publ Rel:
A S Chermay
Counsell: S S Jackson
Gen Purch Agt: L W Shelton
Gen Traffic Mgr: R E Taylor
(See Nev, N Mex, Utah and
subsidiaries, Bear Creek Mng Co,
N.Y., Utah; St
Anthony Uranium Corp, Colo
N Mex)

METAL & THERMIT CORP

100 Park Ave, New York
(See Va)
100 Park Ave, New York 22
Pres: Robert G Page
VP: Cleveland E Dodge,
Walter C Lawson
VP-Comptroller: J Mills
Hawkins
Asst Comptroller: J M Gilkes,
K A Lawrence, A F
Petersen
Treas-Asst Sec: M W Urquhart
Asst Sec-Asst Treas:
R D Barnhart, H R Dobbs
Gen Purch Agt: F A Scheffler
Gen Traffic Mgr: James W Lee
Asst Gen Traffic Mgr:
B Poncea, H Wright
(See Tex, Phelps Dodge Corp,
Ariz, N Mex)

MOLYBDENUM CORP OF AMERICA

375 Park Ave, New York 22
Pres: Max Hirsch
Exec VP: Emil A Lucas
Sec: James S Crawford
Treas: William A Kuntz
(See Calif, Colo, N Mex, Pa)

NATIONAL GYPSUM CO

325 Delaware Ave
Buffalo 2
MINE, Fisher County, Tex
Gypsum
(See Ind, Iowa, Kans, Tex, Va)
NAT'L LEAD CO
111 Broadway, New York 6
Pres: Joseph A Martin
VP: Alfred H Drewes,
Frank J Koegler, David A
Merson, Joseph H Reid,
Wm J Welch
Sec: John B Henrich
Treas: Joseph J Moreman, Jr
Mgr, Mng Dept: G M Wilco
TITANIUM DIV, MACINTYRE
DEVEL, Tahavus, open pit,
Ilmenite, Magnetite
Plant Mgr: John G Hall
Asst Plant Mgr: C R Degor, Jr
B Dellinger
Geol: E G Gross
Ch Eng: R I Kingman
Mine Supt: W M Chapman
FLOT-ORAV-MAGNETIC
SINTER PLANT, Tahavus
(See Ark, Calif, Colo, La,
Mo, Mont, Tenn, Tex, Utah,
Wyo)

NAT'L POTASH CO, SUBSID OF FREEPORT SULPHUR CO & PITTSBURGH CONSOL COAL CO

161 E 42nd St, New York 17
Chmn of Bd: T G Ferguson
VP: W B Burdett
Sec-Treas: A F Rothwell
Purch Agt: J A Brownell
(See N Mex)

NEW JERSEY ZINC CO, THE

160 Front St, New York 38
Pres: R L McCann
VP, Mng & Explor: S B Goodwin
Sec & Treas: Samuel Riker, Jr
Mgr, Mincor: W T Pettijohn
Asst Mgr of Mines: Al Hayes
(See Colo, Ill, N.J., N Mex, Pa,
Tenn, Va, Wisc)

NEW YORK & HONDURAS ROSARIO MNG CO

Rm 1655, 150 Broadway
New York 3
Pres: R M Reininger
VP: H Alsbuler
Treas-Sec: O E McDaniel
Purch Agt: W DI Vergilio
Mgr Mng Dept: H S Anderson

P C MNG CORP

PO Box 72, Schenectady
MINE, Gas Hills, Fremont
County, Wyo, open pit, UG₂
(See Wyo)

PACIFIC TIN CONSOL CORP

120 Broadway, New York
(See subsidiary, Feldspar Corp,
Ca, NC, Tenn)

PHILIPS DODGE CORP

305 Park Ave, New York 22
Pres: Robert C Page
VP: Cleveland E Dodge
Walter C Lawson
VP-Comptroller:
J Mills Hawkins
Asst VP-Sec: John E Masten
Treas-Asst Sec: Martin W
Urquhart
Asst Comptroller: Arthur F
Peterson, Kenneth A
Lawrence, J Milton Gibbs
Asst Sec-Asst Treas: Harold
R Dobbs, Robert D Barnhart
Gen Purch Agt: F A Scheffler
Gen Traffic Mgr: James W Lee
Asst Gen Traffic Mgr:
Harry Wright, Bernard
Fonesta
(See Ariz, N Mex, & Phelps
Dodge Ref Corp, N.Y. & Tex)

PHILIPS DODGE REF CORP (Subsidi of Phelps Dodge Corp)

305 Park Ave, New York 22
Pres: Robert G Page
VP: Cleveland E Dodge,
Walter C Lawson
VP-Comptroller: J Mills
Hawkins
Asst Comptroller: J M Gilkes,
K A Lawrence, A F
Petersen
Treas-Asst Sec: M W Urquhart
Asst Sec-Asst Treas:
R D Barnhart, H R Dobbs
Gen Purch Agt: F A Scheffler
Gen Traffic Mgr: James W Lee
Asst Gen Traffic Mgr:
B Poncea, H Wright
(See Tex, Phelps Dodge Corp,
Ariz, N Mex)

PINNACLE EXPLORATION INC

100 Park Ave, New York
Pres: Phillip D Wilson
VP: J T Hall
Sec: E Arthur Sain
Treas: Frank S Micari
(See Colo)

PLANET EXPLOR CORP

123-15 Metropolitan Ave
New York 15
Pres: Geo Poniatowski
Sec-Treas: Abraham Fried
(See Mont)

REPUBLIC STEEL CORP

R-public Bldg, Cleveland
Ohio
OLD BED, HARMONY &
FISHER HILL MINES, Mineville,
undergr, Magnetite
Mgr: W A Blomstrom
Mine Supt: J R Murphy
Asst Mine Supt: P F Farrell
Eng: A P Hughes
Prod: 6,000 tons daily
MILL, magnetic, Moriah
Prod: 3,000 daily
Sept. J R Scott
CHATEAUGAY MINE, Lyon Mt
undergr & surface, Magnetite
Mgr: A G Crusberg
Supt: Geo Tolosky, Jr
Ch Eng: A K McClellan, Jr
Gen Supt: E D Knox
Prod: 1,250,000 tons per year
CHATEAUGAY MILL,
Magnetite
Supt: J R Tolosky, Jr
Ch Chem: J M Scott
Prod: 3,000 tons conc daily
SINTERING PLANT: Lyon Mt,
Supt: J Kelley
Prod: 385,000 daily
(See Ala, Mich, Minn, Ohio)

RUBBEROID CORP

500 Fifth Ave, New York
MINE, Wheatland Center
(See Vt)

RUTILE MNG CO OF FLA
111 Broadway, New York 6
Pres: Charles C Morris, Jr
VP: John Hess
Sec: A J Drexel Paul, Jr
Treas: Peter E Connell
(See Fla)

ST JOSEPH LEAD CO

250 Park Ave, New York 17
Chmn of Bd: Andrew Fletcher
Pres: Francis Cameron
VP-Sales Mgr: Charles R Ince
VP: Robert Ramsey,
C Merrill Chapin, Jr
Lawrence Riggs III
Treas: James G Colvin
Sec: Donald K Lourie
Asst Sec: William J Elliott
Asst Treas: Edward P Merrill
Comptroller: William L
Murphy, Jr
EDWARDS-BALMAT MINES,
Balmat, St Lawrence County,
undergr, Zn, Pb, Fe
Mgr: Marshall G Jones
(See Mo, Pa)

SHANMOON INDUSTRIES INC

55 Liberty St, N.Y. 5
Pres: S E Shanmoon
VP: C W Armstrong
Sec: J Feldman
Treas: H Linzer
Purch Agt: H Ross
(See N.J.)

SHATTUCK DENN MNG CORP

120 Broadway, New York 5
Pres: Thomas Burton
VP: Thomas V Toasi
Asst VP: T W Newell,
D M Keutner
Sec-Treas: John A Moss
(See Ariz, Colo, Utah)
SOUTHWEST POTASH CORP (Subsidi of THE AMERICAN METAL CLIMAX, INC)
161 Broadway, New York 6
Pres: T W Childs
VP: John Payne, Jr, J G Moore
Thomas E Camp, Jr, P H
Stewart, Jean Vulliez
Sec: E A Weil
Treas: Hans A Vogelstein
Cont: Herbert S Cohen
(See N Mex)

TEXAS GULF SULPHUR

75 E 45th St, New York
Chmn of Bd: F M Nelson
Pres: C O Stephens
VP: E C Meagher, E F
Vander-Stucken, Jr,
C F Fogarty, A W
Strickland, A N Myers,
H S Cawen
Purch Agt: R L Carter
(See Tex)

TRI-STATE ZINC, INC

123 Williams St, New York 38
Pres: R F Player
VP: V C Allen
Sec-Treas: J H Nicholas
(See Ill, Va)

TROUT MNG CO

233 Broadway, New York 7
Pres: C W Anderson
VP: Roy McLeod
Sec: R G Burns
Treas: G A Sennunson
(See Mont)

TUNGSTEN MNG CORP (DIV OF HOWE-SOUND CO)

500 Fifth Ave, New York 36
Chmn of Bd: L W Long
Pres: Wm M Weaver, Jr
VP: F A McGonigle
H S West, Jr
Sec: C R Skinner
Treas: J F Willmott
(See N.C.)

UNION CARBIDE NUCLEAR CO, DIV OF UNION CARBIDE CORP

30 E 42nd St, New York 17
Pres: Lyman A Bliss
VP: Clark E Center,
S J Cromer, A Q Lundquist
W M Smart, C O Strother
(See Calif, Colo, Nev, Utah,
Wyo)

U S BORAX & CHEM CORP, U S POTASH CO DIV

30 Rockefeller Plaza
New York

Pres: J M Gersley
VP & Gen Mgr: P J O'Brien
Sec: W A Ackerman
Treas: R C Dosta
Purch Agt: J C Walker
Asst Gen Mgr: R F Steel
VP & Gen Mgr Pacific Coast
Borax Co Div: J F Corkill
VP & Gen Mgr US Potash Co
Div: D V Parker
VP of Foreign Ops: H C Pearson
VP: Paul Speer
Asst Treas: J H Hadfield
Asst Sec: Gertrude D Stishler
(See Calif, N Mex)

U S GYPSUM CO

Oakfield, Genesee County
MINE, Gypsum, undergr
UNIVERSAL ATLAS CEMENT CORP
Clarence Center
MINE, Erie County,
undergr, gypsum

VANADIUM CORP OF AMER

430 Lexington Ave, New York
Pres: W C Keeley
VP, Mng: D Viles
Sec: D A Shriver
Purch Agt: F W Thomas
Treas: L C Miller
(See Ariz, Colo, N Mex)

WAN CHANG CORP

233 Broadway, New York 7
Chmn of Bd & Pres: T K Li
Exec VP: T F Moran
TUNGSTEN REFINERY, Glen
Cove
(See Calif, Colo, Tex)

WESTERN GOLD & URANIUM, INC

43 Broadway, New York 4
Pres: Russell L Richards
Sec: Berne B Porter
Chair Board-Treas:
Ralph G Brown
(See Ariz, Colo, Utah)

NORTH CAROLINA

ABERNATHY MNG CO

Rt 2, Spruce Pine
Part: J C Wilson
ABERNATHY & SHEETING
HOUSE MINE, Mitchell
County, undergr, mica

APPALACHIAN SULPHIDES, INC

1107-45 Yonge St, Toronto 1
Ontario, Canada
Pres: E R E Carter
VP: R P Mills
Sec: G Gutierrez
Treas: G C Andrew
ORE KNOB MINE, Jefferson,
undergr, Cu
Mine Mgr: L P Eckman
Prod: 950 tons per day
950-TON FLOT MILL, Ashe
County
Mill Supt: S J Nameth

B-K ASSOCIATES, INC

Box 314, Franklin
Mgr: Roy Fouts
CAMPBELL MINE, Macon
County, undergr, mica

BIRCH MNG CO

Plumtree,
Sec: Mrs Sam K Vance
BIRCH MINE, Avery County,
undergr, mica

BOLINGER, H. E., DR

Box 318, Marshall
Oper: Dr H E Bolinger
MOOREHEAD MINE,
STACKHOUSE MINE, Marshall
Madison County, undergr,
Barite

BURLESON & SWANN

Spruce Pine
Part: Robert Burleson
CHAMP RAY MINE, Yancey
County, undergr, mica

CAROLINA PYROPHYLLITE CO-GLENDON DIV

PO Box 2414, Greensboro

Pres: John E Boyd
VP: W B Boyd & S G
Wisconsin
Sec: R E Hardick
Treas: E A Scott
Purch Agt: W F Poat
MINE, open pit, Pyrophyllite
MLLs

CLINCHFIELD SAND & FELDSPAR CO
413 Washington Ave,
Baltimore, Md
MINE, Davis Co, Feldspar
(See Md)

DAVID T VANCE MICA CO, INC
Plumtree
MILL, Mica

DENREE MICA CO
Newdale
Pres: Fred Denree
HARRIS MINE, Yancey County,
surface, mica

DEWELD MICA CO INC
Spruce Pine
Pres: Roy Weld
SPARKS MINE & PLANT
Mitchell County, surface, mica

DIAMOND MICA CO
Spruce Pine
Mgt: R T Dent, Jr
SPRUCE PINE PLANT,
Mitchell County, mica

DUNCAN MNG CO
Spruce Pine
Part: Lewis Aldridge
DUNCAN MINE, Ashe County,
undergr, mica
Idle

ELK MNG CO
Rt 3, Newland
Part: Dayton Ingram
ELK MINE, Avery County,
undergr, mica

EMPIRE MICA CO INC
Spruce Pine
Pres: S L Phillips
CLOUDLAND MINE, Mitchell
County, undergr, mica

ENGLISH MICA CO
Spruce Pine
Sec: Roy Guter
PLANT # 1, mica

FELDSPAR CORP, THE
Box 335, Spruce Pine
Pres: N Cleveland
VP: F S Miller, C F Rogers, Jr
Sec-Treas: G N Stevins
Eng: L L McMurray
MINE, open pit, Feldspar
Gen Mgt: C Rogers, Jr
Asst Gen Mgt: P C Coletta
Supt: Ralph Hughes
Frm: Robert Boone
FLOT MILL, at mine
Supt: B W Hughes
Asst Supt: Carl Burleson
DAY GRINDING MILL, Burns-
ville
Supt: P C Coletta
Cap: 1000 tons per day
Subsidi of Pacific Tin Consol
Corp, N Y
(See Ga, Tenn, Conn)

FOOTE MINERAL CO
16 W Chelton Ave, Phila 44,
Pa
Pres: L C Bliss
VP-Prod: F B Shay
VP-Mktg: J S Gates
Sec-Treas: W Spofford
Purch Agt: W M Raynor
KINGS MT DIV MINE, Kings Mt
open pit, Spodumene, Mica
Mine Frm: L D Day
Mine Supt: E R Gater
Mine Eng: Robert Hall
Plant Eng: H M Broadwater
Process Eng: R W Roeborg
Gen Mgt: N O Johnson
HEAVY MEDIA FLOT MILL,
at mine
Mill Supt: T J Albrecht
Mill Frm: T Gordon
Assay: B Berry
(See Pa, N H, Tenn, Va)

FRANKLIN MINERAL PRODUCTS CO
Franklin
Mgt: Clyde Clark
MICA PLANT, Macon County,
mica

GLENDON PYROPHYLLITE CO INC
Glendon
GLENDON MINE, Pyrophyllite

GRINDSTAFF, FOX, & PHILLIPS
Rt 3, Burnsville
Part: Paul Grindstaff
DE-WELD PROSPECT, Yancey
County, undergr, mica

HARBISON-WALKER REFRATORIES CO
1800 Farmers Bank Bldg
Pittsburgh 23, Pa
ADDS MINE, Jackson Co,
Olivine
(See Pa)

HARRIS CLAY CO, THE
Spruce Pine
Pres: B V Silvia
VP: S W Enloe, Jr
Sec-Treas: Florence Harris
Purch Agt: C F Arrowood
KAOLIN & GUSHER KNOB,
open pit, Kaolin & Mica
Gen Mgt: S L Heaton, Jr
Mine Supt: Avery Pitman,
Howard Franklin
Mine Frm: Guy Henson, Claude
Duncan
Geol: W E Arrowood
Met: Lee White
Elec Eng: Arnold Ellis
130-TON FLOT-GRAY MILL,
Mill Supt: Avery Pitman,
Howard Franklin
Mill Frm: Guy Henson,
Claude Duncan

HITCHCOCK CORP
Murphy
Treas: F C Bourne, Jr
NANCY JORDAN MINES, 2, 3
& PLANT, Cherokee County,
undergr, pyrophyllite, talc

INTERNAT'L MINERALS & CHEMICAL CORP
5401 Old Orchard Rd, Skokie
Ill
MINE, Kona, open pit, feldspar
mica
Gen Supt: L W Breeman, Jr
Asst Gen Supt: Robert Thomas
Mine Supt: C Buchanan
Gen Frm: Clyde Brinkley
Prod: 1,400 tons
MINE, Spruce Pine, open pit
feldspar, mica
Gen Supt: Charles Hickey
Asst Gen Supt: Claude Thomas
Mine Supt: C Stamey
Prod: 700 tons
FLOT PLANTS, at mines
(See Ariz, Ill, Fla, Maine,
Miss, N Mex, S D, Tenn, Va,
Wyo)

KINGS MT MICA CO, INC
Box 700, Kings Mt
Pres: James B Preston, Jr
VP: Herschel E Cole
Treas: Roy H Guter
Sec-Gen Mgt: Paul A Lancaster
PATTERSON MINE, 2 mi NW of
Kings Mt, surface, mica
Prod: 400 tons
400-TON MILL, at mine
Mill Supt: James E White
BOSS MINE, 4 mi SW of Kings
Mt, surface, mica
400-TON MILL, at mine
Mill Supt: Marvin Lancaster
Ore Dressing Eng:
Hugh A Lancaster

LAWSON UNITED FELDSPAR & MINERAL CO

Spruce Pine
Pres & Gen Mgt: T T Lawson
VP: Branch Lawson
Sec-Treas: C D Lawson
MINE, Minto, open pit,
feldspar, mica
FLOT MILL, at mine

LITHIUM CORP OF AMERICA INC
Bessemer City
BESSEMER CITY MINE, open
pit, lithium compounds from
spodumene
Mines Mgt: J N McClure
CHEMICAL PLANT, Bessemer
City
Plant Mgt: R L Nielsen
(See Minn, S D)

LOIS MNG CO
Spruce Pine

Part: S L Phillips
BUCKEYE PROSPECT, Mitchell
County, undergr, mica
Idle

MADE, LEMMIE & CURTIS
Rt 1, Box 141, Danbury
Part: Lemmie Made
MADE MINE, Stokes County
undergr, mica

MCKINNEY & RIDDLE
Spruce Pine
Part: Will McKinney
NELSON BOONE MINE
Yancey County, undergr, mica

MILLRACE MNG CO
Box 87, Spruce Pine
Part: C F Arrowood
MILLRACE MINE, Avery
County, undergr, mica

MINERAL & METALS CORP
Murphy
Sec: F C Bourne, Jr
MULBERRY GAP PLANT &
MINE, Cherokee County,
undergr, pyrophyllite, talc

MITCHELL LUMBER CO
Spruce Pine
Part: Frank Phillips
BANNER MINE, Mitchell
County, undergr, mica

MOUNTAIN MNG CO
Spruce Pine
Part: M E Burleson
JIMMY CUT MINE, Mitchell
County, undergr, mica

NORTH STATE PYROPHYLLITE CO
Pumona
SNOW CAMP & HILLSBORO
MINES, Pyrophyllite

P & N MNG CO
Rt 3, Spruce Pine
Part: S L Phillips
GUDDER MINE, Spruce Pine,
Mitchell County, undergr, mica
TEA CUT MINE, Mitchell
County, surface, mica

PACIFIC TIN CONSOL CORP
(See The Feldspar Corp,
NC & N Y)

PHILLIPS, R B, MNG CO
Spruce Pine
Part: S L Phillips
R B PHILLIPS PROSPECT,
Mitchell County, undergr, mica
Idle

POWHATTAN MNG CO
8721 Windsor Mill Rd
Baltimore 7, Md
KILPATRICK MINE,
Transylvania Co, Asbestos
(See Md)

SHAWNEE MICA MINES
Box 831, Sylva
Sec: Bob Garrett
BOWERS MINE, Macon County,
undergr, mica

SINK HOLE MNG CO
Rt 3, Dakersville
Part: C W Ellis
SINK HOLE MINE # 1 & 2
Mitchell County, undergr, mica

SLIPPERY ELM MNG CO INC
Rt 3, Newland
Sec: Dayton Ingram
SLIPPERY ELM MINE,
Avery County, undergr, mica

SOUTHERN MICA CO
Johnson City, Tenn
SULLINE MINE, Spruce Pine,
open pit, mica
PENLAND-BAILEY, Spruce
Pine
Gen Mgt: Geo Edge
(See Tenn)

STANDARD MINERAL CO
Robbins
Pres: F B Vanderbilt
VP: B B Vanderbilt
Sec: Fred Chappell
Treas: F C Goss
Purch Agt: W J Woodward
SENE, undergr, open pit,
pyrophyllite
Gen Mgt: Fred Chappell
Asst Gen Mgt: Roy Harris

Mine Frm: Cecil Horner
Prod: 65,000 tons yearly
FINE GRINDING MILL,
at mine
Mill Frm: H F McLeurin
Capacity 75,000 tons yearly

SOUTHERN PRODUCTS & SILICA CO, INC
Lilleville
MILL, Silica

STOKES COUNTY MNG CO
Spruce Pine
Part: Lee Medford
SPENCER MINE, Stokes County
undergr, mica

TUNGSTEN MNG CORP (DIV OF HOWE-SOUND CO)
Star Rt, #16139, Henderson
VP & Gen Mgt: James R Sweet
Gen Supt: W R Atkins
Purch Agt: G V Boyd
Ch Eng: A M Synkiewski
Master Mach: W F Edwards
HAMME MINE, Tungsten
undergr, WO₃ concentrates,
holmite, synthetic scheelite
Mine Supt: E H Roberts
Asst Mine Supt: J W Alter
Mine Eng: Philip A Hager
930-TON FLOT-GRAY MILL,
Tungsten
Mill Supt: Carl F Gommel
Asst Pit Supt: J V Hamme
Mill Frm: S Lee Angel
Assay: S B Adams
(See N Y)

UNION REFINING & MNG CO
Box 1247, High Point
Pres: H A Knight, Sr
STAR MINE, Montgomery
County, undergr, Au

WISEMAN, C R
Spruce Pine
WRAY OLIVINE MINE, Yancey
Co, Olivine

YOUNG & ARNOLD MNG CO
c/o Mitchell Lumber Co,
Spruce Pine
Part: Frank Phillips
ARNOLD YOUNG MINE
Mitchell County, undergr, mica

OHIO

AMERICAN ZINC OXIDE CO (Subsidi of AMERICAN ZINC, LEAD & SMELT CO)
1515 Paul Brown Bldg
St Louis 1, Mo
REFINERY, Columbus
VP & Gen Mgt: A C Elde
Gen Supt: W T Maidens
Purch Agt: C M Chambers
(See Ariz, Ill, Mo, Okla, Tenn,
Tex, Wash, Wisc, Utah, N Mex)

BASIC INCORPORATED
845 Hanna Bldg, Cleveland 15
Pres: H P Ellis, Jr
Purch Agt: G H Rutherford
MAPLE GROVE QUARRY &
PLANT
(Mall: Postorial), Maple Grove,
Seneca County, surface,
silomite
Works Mgt: A M Calio
(See Nev)

BUTLER BROS (MA Hanna Co, agents)
1300 Leader Bldg, Cleveland
Chmn of Bd: Patrick Butler
Pres: G W Humphrey
VP: W A Marling, R W Whitney
Sec: S L Engel
Treas: R E Beal
Asst Sec: F W Bennett
Asst Treas: F C Teets
(See Minn)

CLEVELAND-CLIFFS IRON CO, THE
1400 Union Commerce Bldg
Cleveland 14
Chmn of Bd-Pres: # A Sterling
VP: D R Forrest
VP, Mgt: J S Westwater
Exec VP, Finance: H S
Harrison
Exec VP, Sales-Marketing: J S Atbur
(See Mich, Minn)

COLUMBIA-SOUTHERN CHEMICAL CORP
Columbia Ct, Barbours,
MINE, Limestone
(Subsidiary of Pittsburgh Plate
Glass Co)

CONTINENTAL MINERAL PROCESSING CORP
1st Nat'l Bank Bldg
Cincinnati 2
Free & Gen Mgt:
Frederick A Hauck
VP: Albert E Grogan,
Q D Slaughter
Sec: Vincent H Beckman
(See Fla)

DOUGLAS MINING CO
1300 Leader Bldg, Cleveland
(M A Hanna Co, Agts)
VP: W A Marling, S W Whitney
Sec-Treas: S L Engel
Asst Treas: F C Teets
(See Minn)

THE EAGLE-PICHER CO, THE INSLV
American Bldg, Cincinnati 1
Pres: T Spencer Shure
VP: Glen J Christner
Sec: Richard Service
Treas: Carl A Geist
Comptroller: Wm H Dice
(See Ill, Kans, Nev, Okla, Wisc)

M A HANNA CO, THE
1300 Leader Bldg,
Cleveland 14
Agent for the following
companies:

Butler Bros, Douglas Mining
Co, Hanna Mng Co, Hanna Iron
Ore Div (Nat'l Steel Co),
Hanna Ore Mining Co,
Morton Ore Co, Osmak Ore Co,
Phillips Mining Co, South
Agnew Mining Co, Midwest
Ore Co, Hanna Mines Co,
Hanna Develop Co, Hanna
Minerals Co, Hollinger-Hanna
Ltd, Lowthorpe Ore, Ltd, Maria
Luiza Ore Co, Teal Lake Mng
Co,
(See Mich, Minn, Oreg)

HANNA MINING CO
1300 Leader Bldg,
Cleveland 14
Chmn of Bd: J H Thompson
Pres: G W Humphrey
Exec VP: W A Marling
VP, Geo & Devel:
J K Gustafson
VP, Research: D N Vedensky
VP, Mng Opr: R W Whitney
Sec: L W Spang
Treas: R E Beal
Compt: R H Bartholomew
Asst Sec: S L Engel,
L E McChesney, F W
Bennett
Asst Treas: F C Teets
(See Mich, Minn & Hanna
Nickel Smelting Co, Ore)

HANNA ORE MINING CO
1300 Leader Bldg,
Cleveland 14
Pres: G W Humphrey
VP: W A Marling, R W Whitney
Sec-Treas: S L Engel
Treas: R E Beal
(See Minn)

HOBERT BROS, CO, INC
Troy
Pres: Edward A Hobart
VP: Wm Hobart, Sr
Sec: Earl C Galbreath
Treas: D Clayton Jenkins
(See Fla)

INTERNATIONAL SALT CO
Fort & Sanders Bldg, Detroit
Mich
WHISKEY ISLAND MINE,
Hippodrome Bldg
Cleveland, Ohio
(See Mich)

MONTREAL MNG CO
(See Ogilby Norton & Co, Ohio
and Montreal Mng Co, Wisc)

MORTON SALT CO
110 N Wacker Dr, Chicago 6
Illinois
Pres: D Peterkin, Jr
VP, Prod: R C Vail
Sec: L McBride
Treas: Garfield King
Purch Agt: H L Seltzer

Base VP: H R Stratford
FAIRPORT HARBOR MINE,
 Box 280, Fairport Harbor, undergr.,
 rock salt
 Gen Mgr: G G Warren
 Asst Gen Mgr: G R Pyle
 Mine Supt: R G Ganong
 Asst Mine Supt: D D McCormick
 Mine Frmt: M R Barker
 Mine Eng: Robert Ryland
MILL, Fairport Harbor
 (See Ill, Kans, La)

NAT'L STEEL CORP
HANNA IRON ORE DIV
 1300 Leader Bldg,
 Cleveland 14
 Pres: G W Humphrey
 VP: W A Marting, R W Whitney
 Asst Sec: S L Engel,
 F W Bennett
 Treas: R E Beal
 Asst Treas: F C Teske
 (See Mich, Minn & Oark Ore
 Co, Mo)

GOLEBAY HORTON
COMPANY
 1200 Hanna Bldg, P O Box
 6508, Cleveland 1
 Pres: H S Taylor
 VP-Mgr: W D Hamilton
 Sec: G E Guthery
 Exec Agt: T
 Purch Agt: C J Howley, Jr.
 VP-Gen Counsel: J J Dwyer
 (See Oglebay Norton & Co, Minn,
 & Montreal Mng Co, Wisc)
PHILBIN MNG CO (MA
Hanna Co, Agents)
 1300 Leader Bldg, Cleveland
 Ohio
 Pres: G W Humphrey
 VP: C B Jacobs, W A Marting,
 R W Whitney
 Sec: S L Engel
 Treas: R E Beal
 Asst Sec: F W Bennett,
 Graydon Magun
 Asst Treas: W A Lowe,
 F C Teske

PICKARDS MATHER & CO

200 Union Commerce Bldg
 Cleveland 14
 Managing operators for
BALKAN MNG CO, BENNETT
MNG CO, CORNELL MNG CO,
CORSICA IRON CO, CRETE
MNG CO, CUYUNA ORE CO,
ERIE MNG CO, HCVT MNG
CO, LAKE MNG CO,
MAHONING ORE & STEEL CO,
ODANAH IRON CO, PALMER
MNG CO, PURITAN MNG CO,
SUNDAY LAKE IRON CO,
UTICA MNG CO, VERONA
MNG CO, WESTERN MNG CO,
YOUNGSTOWN MINES CORP.
 (See Minn, Mich, Wisc)

REPUBLIC STEEL CORP
 25 Prospect Ave, NW
 Cleveland
 Pres: T F Patton
 VP: E R Johnson
 Gen Mgr: J R McVicker
 Purch Agt: W T Adams
 Idle
 (See Ala, Mich, Minn, N Y)

SOUTH AGNEW MNG CO
 1300 Leader Bldg,
 Cleveland 14
 Pres: A F Peterson
 VP: G W Humphrey,
 P B Entekin, W H Marting,
 R W Whitney
 Sec: S L Engel
 Treas: R E Beal
 Asst Sec: F W Bennett,
 B R Bracker, Francis Van
 Nys
 Asst Treas: R P Fox,
 John Nichols, F C Teske
 (See Minn)

STANDARD SLAG CO
 1200 Wick Bldg, Youngstown
 Pres: L A Beeghly
 VP: W E Bliss
 Sec-Treas: R M Lynch
 Purch Agt: R L Stevenson
 Ch Eng: A W Porter
 (See Nev)

OKLAHOMA

AGRICULTURAL
GYPSUM CORP
 Colony
 Mine, 17 mi E of Cordell,
 open pit, Gypsum

AMER ZINC, LEAD &
SMELT CO
 1515 Paul Brown Bldg
 St Louis 1, Mo
RIALTO & BARBARA J MINES,
 Box 216, Ficher, undergr., Zn
 Pb
 Dist Mgr: D R Stewart
 Gen Supt: O L Green
 Mng Eng: W F Netzeband
 Dir Mng & Mnt Benefici:
 Robert Ammon

Idle
 1,300-TON GRAY-FLOT-MILLS
 See Ariz, Ill, Mo, N Mex, Ohio,
 Tenn, Tex, Utah, Wash, Wisc)
ARKHOLA SAND &
GRAVEL CO
 222 Merchants National Bank
 Bldg., Ft Smith, Ark
FT GIBSON LIMESTONE MINE,
 Ft Gibson, Okla, undergr.,
 limestone
 Supt: G Abercrombie
 (See Ark)

BLACKWELL ZINC
INC
 Division of THE AMERICAN
 METAL CLIMAX, INC)
 91 Broadway, New York 6
 New York
 Pres: H de Neuville
 VP: E T Ross, J Vullquez,
 J Payne, Jr, A E Lee
 Sec: E A Well
 Treas: D J Donahue
 Purch Agt: W F Price
 Controller: H S Cohen
SMEILER, Blackwell
 Mgr: M L Hughes
 Prod: 84,000 tons Zn, yrly
 (See American Metal Climax, Inc)

CORONADO MINES, INC
 300 Wright Bldg, Tulsa 3
 Pres: Milton Leon
 VP: S P Bowyer
 Sec-Treas: A F Bourne
 (See Ariz)

CROSSLAND & LYONS
 Box 205
 Trece, Kansas
CRANE (BLUE BENNETT) MINES
 undergr., Zn, Pb
 Own & Mine Frmt: Ivan Crossland

CROSSLAND, WATKINS
& ALLEY
 Box 221, Trece, Kansas
MCBEE MINE, Zn, Pb
EAGLE-PICKER CO, THE
MNG & SMELT DIV
 Box 916, Miami
 Pres: T Spencer Shere
 VP: O A Rockwell
 Asst to Gen Mgr: Claude Dale
 Dir Personnel & Labor Rel:
 C D Wood
 Comptroller: G N Walbert
TRI-STATE MINES, Cardin,
 undergr., Zn, Pb, Ge
 Gen Mgr: F J Cuddeback
 Asst Gen Supt: L Wetherell
 Geol: Douglas Brockie
 Chief Elec: Claude Rogers
 Div Supts, Maint: C Johnson
 Trans: C Mitchell
 Miner: M Huddleston
 Bert Paul
 W R Sillaway

Idle
CENTRAL GRAY-FLOT-HEAVY-
MED MILL, Cardin
 Mill Supt: Fred Phelps
ZINC RETORT SMELTER,
 Henryetta
 Supt: John Wade
 Rare Metals Lab: Miami
 Prod Mgr: C C Habeger
 Dir Research: W Medcalf
 (See Ill, Kans, Nev, Ohio, Wisc)

HARRISON GYPSUM, INC
 PO Box 118, Lindsay
 Mine, near Cement, surface,
 gypsum

KERR-McGEE OIL
INDUSTRIES, INC
 Kerr-McGee Bldg
 Oklahoma City 2
 Pres: D A McGee
 VP: F C Love
 Sec: S B Robinson
 Treas: H H Raborn
 Purch Agt: D W Lindsay
 (See Ariz, Colo, N Mex, Wyo,
 & Kermec Nuclear Fuel,
 N Mex)

MARK TWAIN MNG CO,
THE
 Box 241, Ficher
 Pres: W L Childress
 VP: W H Childress
 Sec-Treas & Gen Mgr:
 H L Childress
 Purch Agt: Am C Roberts
 Mine Frmt: C A Eiders
JARRETT MINE, 2 mi W & 3
mi N of Ficher, undergr., Zn
Pb
 Idle
SKELTON MINE, 1 mi S of
Ficher, undergr., Zn, Pb
 Idle
 (See Kans)

NATIONAL ZINC CO
 Bartlesville
ZINC RETORT SMELTER
 Mgr: D P Buff
OZARK-MANONING CO
MINING DIV
 310 West 60 St, Tulsa 19
 Pres: R T L Edmark
 Compt: R R McWilliams
 (See Colo, Ill, N Mex)

PHILLIPS PETROLEUM
CO, MNG & MLO DEPT
 Bartlesville
 Gen Mgr: T M Hipp
 Asst Mgr-Contr & Geol:
 C N Holmes
 (See N Mex, Utah)

ST CLAIR LIME CO
 Box 894, Oklahoma City
 Mine, undergr., Lime Plant

TONGAH MINEING CO
 Box 368, Ficher
 Pres: Clarence A Miller
 VP & Gen Mgr: O K Tucker
 Sec: W A Brewer
KITTY MINE, 2 mi W of Ficher,
 undergr., Zn, Pb
 Mine Frmt: Leslie L Marcus
 Idle

TUCK MNG CO
 Box 364, Ficher
WILSON MINE, Zn, Pb
TULSA MINERALS CORP
 Box 5118, Tulsa
 Pres & Gen Mgr: J S Burden
 VP: P T Thibodeau
 Sec & Treas: W G Eastman
 (See Ariz)

U S GYPSUM CO
 300 W Adams St, Chicago 6
 Ill
MINE, BOARD, PROCESSING
PLANT, Southard, Blaine County,
 gypsum
 Plant Mgr: W J Blosser
 Plant Eng-Supt: R E Koggl
 (See Calif, Colo, Conn, Ind, Ill
 Iowa, Mass, S D, Tex, Utah,
 Va)

UNIVERSAL ATLAS
CEMENT DIV, U S
STEEL CORP
 100 Park Ave, New York 17
 New York
WATONGA MINE, Blaine
 County, surface, gypsum

W M & W MNG CO
 Ficher
 Pres: O K Tucker
 VP: F E Williams
 Sec-Treas: Ralph Chambers
 Purch Agt: O K Tucker
MINE, Ottawa County, Zn, Pb

WALTON GYPSUM CO
 805 N 8th St, Fairview
 Mine, near O'Keefe, Blaine
 County, open pit, gypsum
 Gen Mgr: E S Mollard
 Mine Supt: E J Maney
 Mine Frmt: H J Servant
 Mine Eng: A Foster
 Prod: 8,000 tons
 (See Mich, Ohio)

OREGON

ARENZ MNG VENTURE
 870 1st Security Bldg
 Salt Lake City, Utah
BRETZ MINE, Malheur Co,
 mine address: McDermitt,
 Nev, undergr., open pit, Hg
 Supt: Ray F Hickman
 Prod: 150 tons
180-TON FLOT MILL, at
mine
RETORT SMELTER, at mine
 Prod: 180,000 lbs yearly

ASHLAND MINING CO
 835 N Main St, Ashland
 Mgr: Dewey & Fred Van
 Currier
ASHLAND MINE, 3 mi NW of
Ashland, undergr., As
30-TON GRAY MILL & CONCEN
BALTIMORE
SYNDICATE,
LTD

S C M Wagner, Hopper,
 Oregon
MINE, Jefferson Co, Mont,
 undergr., Fe, Zn, Cu
 (See Mont)
BONANZA OIL & MINE
CORP
 Pres: Arthur L. Ades
 VP: D L Milliken
 Sec: Frank Kopelman
 Treas: J H Beck
MINE, Suberilia, undergr.,
Quicksilver
 Mine Supt: Tom Bidwell
 Asst Mine Supt: James
 Goggin
80-TON ROTARY FURNACE
 Mill Supt: M L Conn

BOAZ MNG CO
 708 Joshua Green Bldg
 Seattle 1, Wash
 Supt: I R Maxfield
BUFFALO MINE, Grant
County, Granite dist, undergr.,
As, Ag, Cu, Pb, Zn, Mn
 Mgr: J P Jackson
 (See Wash)

BONANZA OIL & MINE
CORP
BONANZA MINE, Suberilia
 undergr., Hg
 Supt: Durt Avery
 Prod: 30 tons
50-TON ROTARY FURNACE
MILL

BOURNE MINES
 Box 120, Sumpter
MINES, Baker Co, As, Ag

BRISTOL SILICA CO
 Box 427, Rogue River
 Pres: Fayette I Bristol
BRISTOL MINE, 5 mi E of
Rogue River, surface, silica
Mine & Mill Supt: Rolland Jones
 Cons Eng: A O Bartell
 Prod: 200 tons
100-TON MILL, Rogue River

CHEM LIME CO
 Jackson Towers, Portland
 Plant Mgr: Hans Leuenberger
QUARRY, 10 mi W of Baker
Lime
KILN, Wingville

EICKEMEYER BROS
 Post
MAURY MT MINE, Crook
County, Hg
 Idle

GREAT LAKES CARBON
CORP, MNG & MLO
PROD DIV DICALITE
DEPT

Terrahoma
PLANT NO 2 & Mill, 7 mi W
Terrahoma, surface,
dialomite
 Mill Supt: E W West
 Plant Chem: G F Johnston
 (See Calif, Colo, Nev, N Mex)

HANNA MNG CO
 PO Box 85, Riddle
POCKET-MTN MINE, surface
Pb
 Gen Mgr: E S Mollard
 Mine Supt: E J Maney
 Mine Frmt: H J Servant
 Mine Eng: A Foster
 Prod: 8,000 tons
 (See Mich, Ohio)

HANNA RICKEL
SMELTING CO (SUBSID
HANNA MNG CO)
 Box 85, Riddle
 Gen Mgr: E S Mollard
ELEC MELT PLANT
 Pl Mgr: E E Coleman
 Supt: L E Rosner
 Prod: 20,000,000 Lbs
 nickel yearly
 (See Ohio)

HARVEY ALUMINUM CO
 Tarrance, Calif
MINE, Salem Hills area,

Marion County, Ferruginous
 bauxite
 Expior
 (See Calif)

HOLLOWAY, W H
 618 S Oakdale Ave, Madford
JAY BIRD MINE, Jackson Co,
Sh

HI-POTENTIAL MINES
 34 S River Rd, Cottage Grove
 Own: Ray E Nelson
VESUVIUS MINE, undergr., Au
Ag, Cu, Pb, Zn, Mn
 Under devel
5-TON GRAY MILL, Bohemia
 Assayer: Abbott Heasle Inc
PICKETS CHARGE MINE,
 undergr., As
 Under devel

INDIANA MINES, INC
 1408 E 45th, Seattle 5, Wash
 VP: W J Logue
 Sec & Treas: D W Wood
MINE, 30 mi from La Grande,
Union Co, undergr
 Idle

KINGSLEY MINE
 Box 105, Seneca
 Pres: Glenn Findlay
 VP: Buddy Sinyay
KINGSLEY MINE, undergr.,
Cr, O, S
 Idle

LAKEVIEW MNG CO
 Box 1231, Lakeview
 Pres: George A Nicoud, Jr
 Sec: T R Conn
 Purch Agt: T J Wand
WHITE KING MINE, 18 mi NW
of Lakeview on Auger Creek,
open pit, U, O, S
 Gen Mgr: J L Robinson
 Mine Supt: Kenneth J Kuta
 Mine Eng: P P Garding
MILL, Lakeview
 Supt: Oliver Hower
 Asst Mill Supt: John Vecchies
 Chemist: Dale Cutting
 Prod: 210 tons per day

MIA MINES, INC
 PO Box 362, Princeton
MINE, Crook Co, Hg
 Mgr: Frank Reid

MINERAL KING MINE
 34 S River Rd, Cottage Grove
 Own: Harry Williams, Ray
 Nelson
MINE, Bohemia dist, undergr.,
Cu, As
 Under devel

O'KEEFE, WALLACE R
 2314 S E 12th St, Portland
 (See Utah)

SILVER CONSOLIDATED
MINES
 3421 SE 17th Place, Portland
 Supt: R H Turk

SOLAR-X CORP
 8045 Ustick Rd, Boise
 Idaho
MINE, Kitaca, Harney County,
U, O, S
 Expior
 (See Idaho)

STANDARD MINES, INC
 PO Box 381, Prairie City
 Pres: D L Olling
 VP: V Z Jacobson
 Sec-Treas: L D Wilson
MINES, undergr., As, Cu, Co,
Ni
 Gen Mgr: L D Wilson
 Mine Supt: D L Olling
80-TON FLOT MILL
 Mill Supt: V Z Jacobson

SUNBURST, INC
 1875 N W Everett St
 Portland 18
 Chmn & Sec:
 Walter H Schwedler
 Pres: James C Young
 Sec-Treas: Kay Critchlow
 (See Nev, Utah)

TIMBER BEAST MNG CO
 Box 189, Prospect
 Parts: George Slade, W C
 Teagarden, Glen Young,
 C L Sheeters
MINE, Steens Mt area, Harney
County, U, O, S
 Under devel

WERDENHOFF MNG CO
1005 1/2 S 11th St, Tacoma
Wash
MOTHER LODGE, Crook County
Ida
(See Wash)

WESTERN MINERALS CO
313 N G St, Lakeview
Pres: W Smith
VP: Joe Felix
Sect: E E Jaglow
Treas: C H Anderson
Mgr & Purch Agt: M E
Weatherly
ANGEL PEAK MINE, surface,
Ida
Prod: 20-25 tons daily
20-25 GRAY MILL, Lake Co,
ROTARY MILL, at mill

PENNSYLVANIA

ALAN WOOD STEEL CO
Conshohocken
Pres: H R Wood
VP, Plant & Cont: R W Reed
VP, Oper: W E Boger
VP, Marketing: P L Francis
Sect: W B Cashmore
Treas: W M Webb
Purch Agt: C Bishop
(See N J)

ALUMINUM CO OF AMERICA, MINING DIV
1501 Alcoa Bldg, Pittsburgh
Pres: F L Magee
VP, L Litchfield, Jr
Sect: Alfred M Hunt
Treas: E B Wilber
Purch Agt: Ralph Keefe
Gen Mgr in Ch: Ray Mat Div
G W Strevey
(See Ark, Ill, Ky)

BESTWALL GYPSUM CO
120 E Lancaster Ave
Ardmore
Pres: Ramon G Lizzers
Exec VP: Malcolm Meyer
Sect: Arthur D Graves
VP & Treas & Compt:
J N Johnston, Peter
Williamann
Purch Agt: J I Trolley
Asst Sec & Treas:
J L Strickland
(See Iowa, Kans, Mich, N.Y.,
Tex, Utah)

BETHLEHEM CORNWALL CORP
701 E Third St, Bethlehem
Pres: A F Peterson
Mgr: S J Shale
CORNWALL MINE, Cornwall,
undergr, Fe, Cu, Au, Ag, S
6,000-TON MAG
CONCENTRATOR
2,500-TON FLOT PLANT
1,600-TON SINTERING PLANT
GRACE MINE, Morgantown
undergr, Fe
MAG CONC, FLOT PLANT,
pelletizing plant

FOOTE MINERAL CO
18 W Chelton Ave
Philadelphia 44
Pres: L G Bliss
VP: F B Shay
Sect: W R Spofford
Treas: J S Gates
Purch Agt: W M Raynor
Gen Prod Mgr: W B Towner
(See N.H., N.C., Tenn, Va)

GRAPHITE CORP OF AMERICA
Box 9, Chester Springs
Pres: Josef Milner
VP: Stanley Milner
Treas & Sec: Barry Hersch
Purch Agt: C A Schmehl
300-TON MILL, at mine
MINE, Graphite, open pit
Gen Mgr: C A Schmehl
Prod: 300 tons daily

INTERNAT'L SALT CO
NC
Drawer 511, Scranton
Pres: Edward L Fuller
VP: H J Osborn, John L Ryan,
Mortimer B Fuller, Jr
Edson K Green, Myron L
Hyman

Sect: H J Osborn
Treas: M B Fuller, Jr
(See La, Mich, N.Y.)

JONES & LAUGHLIN STEEL CORP
3 Gateway Center, Pittsburgh 30
Chair of Bd-Pres: A C Adams
VP, Prod: A T Lawson
VP & Sec: B F Jones, 3rd
VP & Treas: H H Wunderlick
VP, Purchases: J W Lunsday
Gen Mgr, Ore Mines &
Quarries: C C Henning
(See Mich, Minn, N.Y.)

KEYSTONE FILLER & MFG CO
201 Railroad St, Muncy
Pres: Charles Pfeeger
MINE, open pit, "spontaneous"

MOLYBDENUM CORP OF AMERICA
Washington
Vice Mgr: Eugene F Lukas
PLANT, Washington, Mo, WO₃
PLANT, York, Mo, WO₃, rare
earths
Mgr: W F Allen
(See Calif, Colo, N Mex, N.Y.)

PRINCE MFG CO
Bowmansville
MINE, undergr, mineral
pigment

ST JOSEPH LEAD CO
250 Park Ave, New York 17
New York
SMELTER, Josephtown
Mgr: John G Wehn
(See Mo, N.Y.)

SNYDER MINING CO
812 Oliver Bldg, Pittsburgh
Pres: J P Snyder, Jr
VP & Gen Mgr:
Fayette Brown, Jr
Sect: W Laird Davis
Treas: J K Foster
(See Mich)

U S STEEL CORP
325 William Penn Place
Pittsburgh 39
(See Alaska, Ala, Calif, Minn,
Tenn, Utah, N.Y.)

SOUTH CAROLINA

ALABAMA VERMICULITE CO
Lanford
PATTERSON MINE, Vermiculite

BELL KAOLIN CO
Aiken
MINE, Kaolin

COMMERCIALES, INC
Box 88, Clover
Pres: John Strohl
VP: H S Doty
Sect: E A Jacobus
Purch Agt: H L Wright
HENRY KNOB MINE, 4 mi W
of Clover, surface, kyanite,
pyrite
Gen Supt: J F Castle
Mine Supt: Leonard Hardin
400 TON FLOT MILL, at mine
Mill Supt: Richard Lachmund
Asst Mill Supt: John McGill

DIXIE CLAY CO
Aiken
MCNAMEE MINE, Kaolin

J M HUBER CORP
Chest water
PANASON & BARDEN MINES,
Kaolin

INDUSTRIAL MINERALS INC
York
Pres & Gen Mgr: L G Wilson
VP & Sec: W F Wilson
KINGS CR MINE, 14 mi W of
York, surface, barite, open pit
Chief Eng: J B Jere
Mine Frms: W M Westmerville
Prod: 100 tons
KINGS CR FLOT MILL, 20-ton
crush & grind

INTERNATIONAL CLAY CORP
Graniteville
MINE, Kaolin

MINERAL MNG CORP
Lancaster
MINE, undergr, ericite mica
Supt: Frederick Bingham

NATIONAL KAOLIN PRODS CO
Box 431, Aiken
MINE, Kaolin

NEW JERSEY ZINC CO
Rd 81, Center Valley
MINE, Friedensville, undergr,
Zn
Supt: S B Huyett
Mine Mgr: H B Willes
Services: M S Childs
Eng-Geol: W T Forsyth
FLOT MILL,
Mill Mgr: J R Pellett
RETORT, Palmerston
Plant Mgr: A P Maunke
(See Colo, Ill, N.J., N Mex,
N.Y., Tenn, Va, Wisc)

OREFRACTION MINERALS INC
Andrews
GRINDING PLANT, Zircron

PACO PRODUCTS INC
Picolet
FLOT-MILL, Spartanburg
County, Feldspar, silica, mica

SOUTHEASTERN CLAY CO
Aiken
JOHNSON, RODGERS,
GARDNER & TOOLE MINES,
Kaolin

SOUTHERN VERMICULITE CO
Enoree
MINE, Vermiculite

UNITED CLAY MINES CORP

North Aiken
MINE #7, open pit, Kaolin
Mine Supt: J J Godla
MILL, at mine
(See Fla, Ga, Md, N.J., Tenn)

U S VERMICULITE CO
Enoree
MINE, Vermiculite

ZONOLITE CO
Kearney Mill Enoree
Pres: J A Kelley
Purch Agt: M E Chambers
MINE, open pit, Vermiculite
Supt: J Brevington
Mine Mgr: A H Skardon
Metal: L J Hersh
FLOT MILL
Supt: W J Melcher

SOUTH DAKOTA

A B W MINERALS
Custer
MINE, pegmatites

A & V MINING CO
Custer
MINE, Custer Co, pegmatites

ABINGDON POTTERIES INC
Abingdon, Ill
WHITE ELEPHANT MINE,
Custer Co, pegmatites

AMERICAN COLLOID CO
3100 Safford Ct, Shakie, Ill
BELLE MINE, Belle Fourche,
surface, bentonite
Mgr: Claude Acord
Prod: 600 tons
(See Ill, Miss, Wyo)

AMERICAN MNG & SMELTING INC
344 5th St, Spearfish
MINE, Ugo

BALD MTN MNG CO
Trojan
Pres: O D Collis
Treas: Ward Reidesel
Asst Treas: Mildred Stevens
Gen Mgr: P A Miller

Asst Gen Mgr: A F Zupet
PORTLAND, CLINTON,
DAKOTA, DECORAH, MINES,
Trojan, undergr, open-pit, Au
Ag
350-TON CYANIDE MILL,
Trojan, Au, Ag
Ida
(See Iowa)

BARCO MINERALS INC
Box 432, Sturgis
Pres: Richard B Williams
VP: M H Braden
Sec-Treas: Ruth I Williams
SPOOKY JOE MINE, open pit,
Ugo, Vgo
Gen Supt: M H Braden
Geol: Fred R Williams
Mine Engr: Don Braden
Prod: 10 tons

BEAR LODGE MINERAL CORP
210 W 23rd St, Cheyenne, Wyo
MINE, Ugo

BETTENHAUSEN & WHEELER
Edgemont
MINE, Ugo

BLACK FOOT COPPER CO
Edgemont
Pres: H L Bieber
MINE, Pennington Co, pegmatites
pegmatites

BLACK MILLS KEYSTONE CORP
Keystone
Pres: W K Wallace
INGERSOLL MINE, 2 mi NW of
Keystone, undergr, open pit,
pegmatite minerals, lepidolite,
mica, tantalite, feldspar, beryl
Supt: Clifford Kuborn
50-TON FLOT MILL,
Mgr: A I Johnson

BLACK MAX, INC
c/o Elmon Roy, Custer
BOB WHITE MINE, Custer Co,
pegmatites

BLAND MNG & MFG CO
Box 734, Custer
Pres: G V Bland
VP: G C Bland
BLECHER #3 MINE, undergr,
open pit, beryllium, feldspar,
mica, tantalum, lithium
Mine Supt: G C Bland
GRAV MILL, at mine

BLUE OX MNG CO
Rapid City
MINE, Pennington Co, pegma-
tites

BROWN, MATTHEW J
Edgemont
MATIAS PEAK & TAYLOR
XLEASE MINES, Ugo

CARIBOU KENNEDY
c/o A C Kennedy
Box 974, Edgemont
STATE #1 MINE, Ugo

CHASE MNG CO
Box 675, Edgemont
MINE, Ugo

CHORD URANIUM CO
Box 881, Edgemont
DARROW, KING MINES, 13 to
15 mi N of Edgemont, Ugo
Prod: 400 tons per mo

CONS FELDSPAR CO
Keystone
Pegmatite producer

DAKOTA BERYLLIUM & OIL CO
Edgemont,
R&D BIRD LODGE, Pegmatites

DIAMOND MNG CO
Edgemont
MARTY LEASE MINE, Ugo

GIANT CYCLE CORP
Box 1028, Edgemont
Pres: Merrill Shoup
VP: Max W Bowen
TRIANGLE MINE, 23 mi NW of
Edgemont, undergr, Ugo
Res Mgr: John Seerley
Asst Gen Mgr: George Murray
Ch Eng: L E Lewis
Frm: George Smith
(See Colo)

EVERETT AND MARIE HILL
Star Route, Hot Springs
MINE, Ugo

HILLS MATERIAL CO
Box 1342, Rapid City
Pres: M E Adelstein
VP: J L Mater
Gen Mine Supt: John Holmes
MINE, gypsum
Idle (except for crushed lime-
stone rock)

HOMESTAKE MNG CO
Lead
HOMESTAKE MINE, undergr,
Au
Mgr: Black Hills oper:
James O Harder
Mine Supt: C N Kravitz
Asst Mine Supt: W C Campbell
Ch Geol: A L Slaughter
Ch Mech Engr: LeRoy Seyhera
Ch Met: C E Schmidt
Ch Elec Engr: Rex Tario
Safe Engr: Phil Graves
Purch Agt: F E Bryan
Prod: 4,700 tons daily
4,700-TON CYAN MILL, at
mine
(See Calif, N Mex, Utah, Wyo,
Homestake Partners & Home-
stake-Sopar Partners)

INTERNAT'L MINERALS & CHEMICAL CORP
5401 Old Orchard Rd, Shakie,
Ill

MINES, Custer, open pit,
feldspar
200-TON MILL, Custer, dry
grinding
Mine Frms: A E Boone
MINE, Keystone, open pit,
feldspar
75-TON MILL, Keystone
Mine Supt: A E Boone
Mine Frms: Iren Green
(See Ariz, Fla, Ill, Minn, Miss,
N Mex, N.C., Tenn, Va, Wyo)

KEYSTONE FELDSPAR & CHEM CO
Keystone
Mgr: Thomas Eden
Pegmatite producer
(See Ill)

LIEN, PETER, & SONS
Box 1073, Rapid City
Pres: Peter C Lien
VP: Charles H Lien
Sec-Treas: Bruce A Lien
QUARRY & MILL, limestone
Gen Supt: Robert Groesbeck
Geol: Ray Smith
Mine Supt: Al Johnson
Elec Eng: Elmo More

LITHIUM CORP OF AMERICA, INC
2500 Rand Tower,
Minneapolis 2, Minn
Pres: H W Rogers
MINES, near Hill City, undergr,
surface, Li
Gen Mgr: John C Talley, Sr
FLOT MILL, Hill City
Supt: Carleton B Harris
(See Minn, N.C.)

LORENZ BROS
Hot Springs
DAMSDITE #1, 8 mi NE of Edge-
mont, Ugo

LUCKY SIX MNG CO
Sorum
MINE, Ugo

MAYWOOD CHEM WORKS
Hunter Ave, Maywood, N.J.
ETTA MINE, Keystone,
apodumene
Mgr: Dewey Peterson

MC CARTY - PULLEN MINES
Custer
MINES, Pennington Co, pegma-
tites

MC KENNA, WALTER L
Box 884, Edgemont
MINE, Ugo

MINERALS MILLS, INC
Custer
Pres: Albert Gushurst
Sec & Gen Mgr: A I Johnson
GLENWOOD MINES, 4 mi NW
of Custer, mica
under devel

MINES DEVELOPMENT, INC

777 Grant St, Denver, Colo
400-TON MILL, Edgemont
Mill Supt: H D Webb
Pres Mgr: G T Ester
Prod From: O M McGuire
Met Consult: H L Hazen
(See Colo)

MONTANA CHEM & MNG CORP

Box 1066, Edgemont
MINE, U₃O₈

MYLETT MNG ACCOUNT

Rapid City
SACKETT FRACTION LODE,
Pegmatites

NAT'L LEAD CO

BAROID SALES DIV
Belle Fourche
Local Rep: Dave Rowland
(See Calif, N Y, Utah)

NORTHWEST DEFENSE MINERALS INC

Spearfish
MINE, Lawrence County
Pegmatites

C C PEASE

Box 373, Sundance, Wyo
(See Wyo)

RIMROCK MNG CO

Box 276, Sturgis
MINE, U₃O₈

ROCHFORD THREE STATE MNG CO

310 Main St, Miles City
Montana
MINE, Pennington Co, U₃O₈

ROGERS & OSBORNE MNG

3012 11th Ave, Belle Fourche
KLING NO 1 MINE, U₃O₈

ROSEBERRY, CARL

Custer
Pegmatite producer

SHELDON-WARREN OIL CO

746 Petroleum Bldg
Roswell, N Mex
Pres: Gordon E McMeen
VP: Homer F Glover
Sec-Treas: David J McKee
K-9 & McLEOD MINES,
Edgemont, open pit, U₃O₈,
V₂O₅
Gen Mgr: Harry Engman, Jr
Asst Gen Mgr: Earl Long
Under devel

SCOTT'S ROSE QUARTZ CO

Custer
Mgr: Frank S Scott
RED ROSE & MOUNTAIN ROSE
MINES, at Custer, open pit,
pegmatite minerals

SODAK URANIUM & MNG CO

Box 330, Edgemont
TOO LATE MINE, U₃O₈

SPRING, KENNETH

Custer
Pegmatite producer

SUNDANCE PETROLEUM & URANIUM CO

Box 393, Spearfish
MINE, Crook & Johnson Co, Wyo
U₃O₈
(See Wyo)

TRIANGLE ENTERPRISES, INC

Edgemont
BUD MINE, 13 mi N of
Edgemont, U₃O₈
(See Grant Cycle Corp)

TRIO MNG CO

3 Alvin Kolb, Bison
TRIO LODE 1-3 MINE, U₃O₈

U S GYPSUM CO

Piedmont
Gypsum products
(See Calif, Colo, Conn, Ill, Ind,
Iowa, Mass, Okla, Utah, Va,
Tex)

URANIUM & ALLIED MINERALS INC

205 Security Bldg, Box 113
Keystone

DYKE LODE, HOLY TERROR MILL MINES, Pegmatites**VICKERS FELDSPAR CORP**

Box 93, Keystone
BIG CHIEF, Pennington County
Pegmatites

WHITE CAP MNG CO

Keystone
Mgr: L R McCarty
Pegmatite producer

YORK MINERALS

848 Custer Ave, Custer
Pres: L R York
VP: Joe Cavalletto
Sec-Treas: Virginia Klodt
RED DEER MINE, Custer
County, mica, Beryl
Mine Supt: Francis Duncan
Prod: 500 tons daily

TENNESSEE**AMER ZINC CO OF TENN** (Subsidiary of Amer Zinc, Lead & Smelt Co)

Mascot
VP: H A Coy
Mgr: William Black
Gen Supt: M J Langley
Mgr of Mines: R E Calhoun
Supt, Jefferson County Mines:
Harry L Miller
Supt, Young Mine, R R Medley
Supt, Mascot No 2 Mine:
Glenn Hurst

Purch Agt: C C Sisk
Ch Eng: W N Johnson
Ch Geol: C R L Oder
Supt, Mech-Elec Dept:
Ivan D Campbell
Personnel Dir: J L Allison
Safety Eng: H F Thompson
Mill Supt: D B Grove
Ch Chem: D E Chadwick
Asst Mill Supt: J H Polhemus
MASCOT NO 2 MINE, Mascot,
undergr, Zn Sulphide
YOUNG MINE, South Friends
Station, undergr, Zn Sulphide
NORTH FRIENDS STATION
MINE, North Friends Station,
undergr, Zn Sulphide
GRASSELLI MINE, New Market
undergr, Zn Sulphide
COV MINE, Jefferson City
undergr, Zn Sulphide
4500-TON FLOT GRAY MILL
HMS, Mascot
(See Ariz, Mo, Ill, Ohio, Okla,
Tex, Utah, N Mex, Wash, Wisc)

ARMOUR FERTILIZER WORKS INC

Columbia
Supt: W B King
McKENNON MINE, Phosphate
(See Fla)

B & T MNG CO

Box 659, Bristol
Part: Harold & J E Tipton
B & T MINE, Johnson County,
open pit, Mn
Gen Supt: J R Sluder

M C BOYLE PHOSPHATE CO

Centerville
BRATTON MINE, Phosphate

COLUMBIA ROCK PROD CORP

Pressnell Bldg, Columbia
Pres: Wayne Pressnell
VP: Harry Pressnell
Sec-Treas: Wm C Fraser
Asst Sec-Treas: W J Davis
MINE, undergr, limestone
Gen Mgr: Harry Pressnell
Prod: 2,000 tons
2,000-TON MILL, Columbia

CONSOL HIGH GRADE ORE CO

Calhoun
Part: G S Murray, I B Murray,
J D Murray
MINE, Calhoun, open pit, Ba
Mine Supt: Earl Sledge
Under devel

FELDSPAR CORP, THE

Erwin
GRINDING MILL, Dry Grinding
Feldspar

Supt: T S Hughes
Asst Supt: Ford McKinney
(Subsidiary of Pacific Tin Consol
Corp, N Y)

(See Ga, N C, Conn, Pacific
Tin Consol, N Y)

FOOTE MINERAL CO. ELECTRO MANGANESE DIV

1408 Lorraine
Knoxville 1
Div Acct: Otto Neumann
TWO PLANTS, Knoxville
1323 Proctor Street
1408 Lorraine Street
(See N H, N C, Pa, Va)

HARSH PHOSPHATE CO

785 Murfreesboro,
Nashville 10
Gen Mgr: M G Marsh
Sect: T L Harsh
MINE, 3 mi SE of Nashville,
surface, ground, phosphate
rock

HIGHLAND MINING CORP

Centerville
Pres & Gen Mgr: Bill Davis
VP: D Brown
Sec: M Brown
HIGHLAND MINE, Centerville
surface, phosphate rock

HOOKER CHEM CORP

Columbia
MINE, Phosphate

INTERNAT'L MINERALS & CHEMICAL CORP

5401 Old Orchard Rd, Skokie
Ill
CONSOL FELDSPAR DEPT,
Erwin
Prod Mgr: Charles Hunter
Asst Prod Mgr: J R LeGrand
Purch Agt: Paul Willis
WALES PLANT
Gen Supt: J W Cooksey
MICA PLANT, Erwin, dry
grinding
Gen Supt: J R LeGrand
100-TON MICA FLOT PLANT,
Greenville
Gen Supt: Phil Thomas
(See Ariz, Fla, Ill, Maine,
Miss, N Mex, N C, S D, Va,
Wyo)

MCMINN BARIUM CORP

Box 284, Sweetwater
ATHENS MINE

MONSANTO CHEM CO

Columbia
MINE, 7 mi SW of Columbia,
surface, dragline excav,
phosphate
Gen Mgr: J L Whiteside
Prod Supt: R L Neubert
Maint Superv: W G Allen
Pers Superv: F C Thomas, Jr
Local Mines Superv: J W
Steenbergen
Purch Agt: R G Black
Mine Supt: H A Webster
Asst Supt: Wm Collette
Furnace Supt: C C Hales
Eng Supt: H C Nelson
Maint Supt: Norman Smithson
Prod: 2,800 tons
GRAY MILL
ELEC FURN, 25,000-kw
yellow phosphorus
(See Idaho, Mo)

NATIONAL LEAD CO BARITE DIV

Box 187, Sweetwater
Mine & Mill Supt: J T Keim
Asst Supt: H K Beggs
BALLARD, JONES & STEVENS
MINE, surface, barite
Prod: 70 tons per day
200-TON GRAY MILL, washing
jigging, grinding
Mill Frmt: Jack Goodman
(See Ariz, Calif, Colo, La, Mo,
Mont, Nev, N Y, Tex, Wyo)

NEW JERSEY ZINC CO

160 Front St, New York 38
New York

JEFFERSON CITY & FLAT GAP MINE, Jefferson City, undergr, Zn

Gen Supt, Tenn Oper:
Johnson Crawford
Supt: H G Miller
Mine Ch: D H Jolly
Plant Ch: R E Dougherty
Geol: D L Kendall
Mine Frmt: J P Provost

MILL FLAT GAP OPERATION, Treadway

Supt: J I Craig
Mine Ch: A C Savage
(See Colo, Ill, N J, N Mex,
N Y, Pa, Va, Wisc)

OWENS AGRICULTURAL PHOSPHATE COMPANY

Box 358, Centerville
MINE

PRESSNELL PHOSPHATE CO, INC

Pressnell Bldg, Columbia
Pres: Wayne Pressnell
VP: Harry Pressnell,
H R Mosley
Sec-Treas: W J Davis
Asst Sec-Treas: Jm C Fraser
MINE, surface, phosphate
Prod: 1,000 tons
150-TON FLOT MILL, Columbia

PRINCE, J T

Box 610, Pulaski
MINE, Phosphate

RIVER & RAIL PHOSPHATE CO

135 2nd Ave N, Nashville
Pres & Gen Mgr: L N Jordan
Sec: S E Wheeler
Gen Supt: Claude Warren
MINE, 6 mi NW of Nashville,
surface, dragline, raw
phosphates
PLANT, Jordan, Tenn

SMITH MINES, INC

RT 3, Sweetwater
SWEETWATER MINE, Ba

SOUTHERN MICA CO

Johnson City
Pres & Gen Mgr: C F Edwards
Ill
VP & Purch Agt: J T Blanchard
Sec: Elizabeth Powell
Treas: Wanda B Hammett
MINE, Mailing
Mine Supt: George W Edge
Prod: 40 tons daily
MILL, Johnson City
Supt: J F Reynolds
Frmt: Haskell Garland

TENNESSEE COPPER CO

Copperhill
EUREKA, BOYD, CALLOWAY,
MARY MINES, Ducktown, Polk
County, undergr, Sulphuric
acid, Fe, Cu
Pres: T A Mitchell
Mgr: R R Burns
Gen Supt: L Weaver
Geol: Owen Kingman
Elec Eng: L B Murray
Mine Supt: H F Kendall
Asst Mine Supt: R G Clay
Prod: 110,000 tons per month
110,000-TON FLOT MILL,
Ducktown
Mill Supt: F M Lewis
REVERB SMELTER, Copper-
hill
Supt: W Y Quarry
Asst Supt: W F Hardin
Output: 20,000,000 lbs Cu
yrly

TENNESSEE MNG CO

Madisonville
NONABURG MINE, Fe

TENNESSEE VALLEY AUTHORITY

Knoxville
KNOB CREEK, Columbia, 3
mi N of Columbia, surface,
phosphate
Gen Mgr: Aubrey J Wagner
Gen Supt & Geol: R S Ingle
Mgr Eng: Henry T Puss
Safety Eng: Karl W Potts
Mink Supt: Charles A Irwin
Prod: 750 tons

UNITED CLAY MINES CORP

Gleason
Mine Supt: C A Roberts
Asst Mine Supt: Doyle Bullock
Mine Eng: R D Lowe
MINE #6, open pit, ball clay
MILL, at mine
(See Ga, Fla, Md, N J, S Car)

U S STEEL CORP, TENN COAL & IRON DIV

Jefferson City
ZINC MINES WORKS
Gen Supt: R T Wilson

Geol: S K Mynatt

MINE, undergr, open pit, Zn
Mine Supt: C E Piper
Mine Frmt: J H Kerr
Mine Eng: J A Miller
FLOT MILL
Mill Supt: J A Rhoton
(See Alaska, Ala, Calif, Minn,
Pa, Utah, Wyo)

URA-MANG CORP

Bonnie Kate Bldg
Elizabethton
MINE, Ma

VALLEY MNG CO, LTD

Shady Valley
BLACKBURN & BARRY
BLYVINS MINES, Ma

VICTOR CHEM WORKS

155 N Wacker Dr, Chicago
6, Ill
MINE, Mt Pleasant, Phosphate
GLOBE MILL
(See Fla, Ill & Mont)

WEST, M C

PO Box 381, Columbia
BRATTON & TENNESSEE
MINES, Phosphate

VIRGINIA-CAROLINA CHEM CORP

401 E Main St, Richmond, Va
MINE, Mt Pleasant, open pit,
phosphate rock
Mgr: M D Girardeau
(See Fla, Va)

VIRGINIA IRON, COAL & COKE CO

325 W Campbell Ave,
Roanoke
Pres: Samuel T Brown
VP: Samuel T Brown, Jr
Sec-Treas: Joyce C Elmore
STONE CREEK MINE,
Elizabethton, open pit, Mn
Gen Mgr: H J Butler
Mine Supt: Walter Smith
Prod: 10 tons per day
FLOT MILL, Stony Creek

TEXAS**ALUMINUM CO OF AMERICA**

1501 Alcoa Bldg, Pittsburgh 19
Pres: Frank L Magee
REFINING & REDUCTION
WORKS, Point Comfort &
Rockdale
Oper Mgr: B H Sloane, Point
Comfort

AMERICAN SMELTING & REFINING CO

Box 1111, El Paso
Mgr: Ben D Roberts
EL PASO SMELTING WORKS,
2 mi N of El Paso, Pa, Cu
smelting & converting, Zn
fuming
Supt: T J Woodside
Pl Eng: J W English
Supply Agt: R E Redman
(See Ariz, Calif, Colo, Idaho,
Ill, Md, Mont, Neb, N J, N Mex,
NY, Utah, Wash & Fed Mng &
Smelting Co, Mo)

AMER ZINC CO OF ILLINOIS (Subsidiary of AMER ZINC, LEAD & SMELT CO)

Box 577, Dumas
RETORET SMELTER, Dumas
Mgr: J E R Smith
Supt: O R Bailey
Pl Eng: O B Thomas
Purch Agt: W G Hollifield
Office Mng: J C Kersten
Output: 100,000,000 lbs Zn
yearly
(See Ariz, Ill, Mo, Ohio, Okla,
Tenn, Wash, Wisc)

ARMCO STEEL CO SHEFFIELD DIV

Box 3120, Houston
MINES, Morris County, Fe
PLANT, Houston

BESTWALL GYPSUM CO

120 E Lancaster Ave
Ardmore, Pa
MINE, Hardens County
Gypsum
(See Iowa, Kans, Mich, N Y, Pa
Utah)

CAPITAL-SEABOARD CORP

334 Denver U.S. Nat'l Bldg.
Denver, Colo
Pres: Joseph H. Corbin
VP: Ray A. Bennett
Sec-Treas: James S. Smith
Purch Agt: Oil Maxwell
(See Ariz., Idaho, Mont., N. Mex., Utah)

CASNER GYPSUM CO INC

3347 Louisville St., El Paso
MINE, Hudspeth County, gypsum

THE CELOTEX CORP., HAVILIM DIV

1205 S. LaSalle St.
Chicago, Ill.
MINE, Longworth, Fisher
County, gypsum
(See Ill.)

CHRISTIAN & SONS

c/o Henry Christian
Gonzales
MINE, Hudspeth County, talc
susceptance

DUVAL SULPHUR & POTASH CO

17th Fl. Mellicamperson
Bldg., Houston 3
Pres: W. P. Morris
ORCHARD MINE, 2 mi SE of
Orchard, sulphur
Acting Res Mgr: X. T. Stoddard
(See N. Mex., Ariz.)

FLINTKOTE CO., THE

Brewster
MINE, Sweetwater, Nolan
County, gypsum
(See Ariz., Calif., Nev.)

GINKHALT MINERALS CO

Plainview
Pres: H. Hinton
HORNET & AMERICAN MINES,
8 mi W Hachita, N. M., undergr.
Fe, Zn, Ag
Gen Mgr: Lou Jordan
Mine Frm: Charles Gardner
95-TON GRAY MILL, at mine
(See N. Mex.)

GLENN-REY CORP

Chatsworth, Ga.
Mgr: Francis T. Glenn
MINE, Hudspeth County, talc
susceptance
(See Ga.)

JEFFERSON LAKE SULPHUR CO

1408 Whitney Bldg.
New Orleans 12, La.
CLEMENS DOME, Brazoria
LOW POINT DOME, Port
Bend County
Gen Mgr: Harvey A. Wilson
Asst Gen Mgr: L. V. Lebeck
Gen Supt: L. B. Jensen
Geol: C. D. Blanche
Mech Eng: T. R. Trahan
Met: I. E. Warren
Elec Eng: Oliver Romero
Asst VP: H. J. Grace
Prod: 1500 long tons per day
(See La.)

LONG STAR MNG CO

3600 Conway, Fort Worth
MINE, Hudspeth County, Hg
Under devel

LONG STAR STEEL CO

Box 12226, Dallas
Pres: E. B. Germany
Exec VP: W. H. Johnson
VP Oper: E. G. Grapher
VP Sales: W. T. Moreland
VP Pub. Rel. & Adv.
L. D. Webster
VP Purch. & Sec: J. M. Morris
VP Cost & Asst. Treas.
Max Dodson
Works Mgr: J. M. Brashear
COKE & IRON DIVISION
Coke & Iron Supt: S. G. Anderson
Ore Div Supt: A. B. Drescher
Mng Supt: V. F. Malone
Benef. Asst Supt: V. Camp
Gen Mng Frm: R. T. Dudley
Gen Benef Frm: J. J. Bassett
Chief Ore Eng: F. Dressner

SERVICES

Indus. Rel. Dir: P. C. Russell
Ch. Engr: J. O. Farrell
Safety Dir: R. S. Beasley
LONG STAR MINES, BLACK
MT, HUGHES SPRINGS
ROGERS, KING & OTHERS
13,000-TON GRAY MILL

**Calcining, sintering & washing
BLAST FURNACE**

Cap: 1,300 tons daily

MAGNET COVE BARIUM CORP

Box 5504, Houston 3
MINE, Zavalla, open pit, clay
Div Mgr: C. L. Wilkinson, Jr.
Plant Mgr: A. T. Donovan
250-TON MILL, dry grinding
Mill Frm: Robert Chambers
BARITE GRINDING PLANT
Brownsville
(See Ark., Fla., Mo., Nev., Wyo.)

MORTON SALT CO

120 So. LaSalle, Chicago 3,
Ill.
MINE, Grand Saline, salt
Mgr: Reid Lesser
Asst Mgr: J. L. Sellers
Prod: 600 tons
(See Ill., Kans., La., Ohio)

NASH MINES

406 Nash Bldg., Austin
Own: Jax P. Nash
(See Ariz.)

NATIONAL GYPSUM CO

325 Delaware Ave., Buffalo 2
New York
MINE, Fisher County, 7 mi N
of Rotan
PLANT, 1 mi S of Rotan
(See N. Y.)

NATIONAL LEAD CO., TEXAS MINING & SMELTING DIV

Box 559, Laredo
Mgr: J. C. Archibald Jr.
Ch. Chem: Fidel Gonzales
Compt: Claude Notson
REVERB & BLAST FURNACE,
FUMING PLANT, Highway 51
N. Laredo
Plant Supt: R. L. Kulpacs
(See Ark., Calif., Kans., La., Mo.,
Mont., Nev., N. Y., Tenn., Wyo.)

NATIONAL LEAD CO. BAROID DIV

Box 1675, Houston
Gen Mgr: G. B. Coale
Asst Gen Mgr: J. W. Hofstetter
Asst to Gen Mgr:

F. J. Hagstette, Jr.
H. H. Farnham
Prod Mgr: Reginald Rowand
CORPUS CHURET PLANT,
barite, dry grinding mill
Mill Supt: T. A. Studer
HOUSTON PLANT, bentonite,
barite, dry grinding mill, oil
well chem.
Supt: R. J. Penrose
MULDOON MINE, Muldoon
bentonite, surface
Supt: R. J. Penrose
TEKARKANA PLANT, Temar-
kana, oil well chem, dry
grinding
(See Ark., Calif., Colo., La., Mo.,
Mont., N. Y., Tenn., Wyo.)

PELTON, CLYDE V

PO Box 422, Carlsbad,
N. Mex.
MINE, Hudspeth Co., talc
susceptance
(See N. Mex.)

PHILIPS DODGE REFINING CORP. (Subsidiary of PHILIPS DODGE CORP.)

Box 1372, El Paso
ELEC COPPER REFINERY,
COPPER SULPHATE PLANT,
also NISO, Se, Te
Works Mgr: I. A. Donahue
Asst Works Mgr: M. S. Bell
Prod: 576,000 refined cu
yearly
(See Ariz., N. Mex., N. Y.)

PIONEER TALT CO

Chatsworth, Ga.
Pres: M. W. Glenn
VP: C. C. Lark
W. W. Hoff
Sec: R. Smith
Treas: F. T. Glenn
MILL, Allamore
Prod: 120 tons daily
Under devel

QUEEN CORP

5307 Broadway, San Antonio
(See Utah)

RADIATION EXPLOR CO, INC

Box 151, Henrietta
Pres: C. L. Brownlow

VP James W. Hradz

Sec: Paul Eggers
TWIN RATTLER & CROWN
MINES, Foot, open pit, U₃O₈
Gen Mgr: C. L. Brownlow

RARE METALS CORP OF AMERICA

1st Security Bldg.
Salt Lake City 11, Utah
(Affiliate of EL PASO NATURAL
GAS CO, Texas St. at Stanton,
Box 1462, El Paso)
Pres: C. L. Perkins
VP & Asst Gen Mgr:
H. M. Kline
(See Ariz., Idaho, N. Mex., Utah)

REYNOLDS METALS CO

Reynolds Metals Bldg.
Richmond, Va.
150 TON FLOT MILL, Eagle
Pass, CalZ
Gen Mgr: R. H. Zeglin
Mgr: F. O. Sorel
Mill Supt: F. G. Ovis
(See Ariz. & Va.)

SILVER STAR-QUEENS MINES, INC

905 Trans American Life
Bldg., Ft. Worth 2
Pres: Joe A. Foster
VP: Robt. Decker
Sec-Treas: T. O. Briggs
Purch Agt: Ralph Thurston
(See Idaho)

SOUTHWESTERN GRAPHITE CO

Burnet
Pres: George W. Clemens
VP: Robert P. Miller, Sr.
VP & Gen Mgr: R. P. Miller, Jr.
Sec-Treas: Robert P. Miller, Jr.
Supt: G. C. Hilliard
Geol: D. C. Peacock
Elec Eng: Geo. Lockwood
MINE, 11 mi NW of Burnet,
surface graphite
Mine Frm: Pete Bible
Prod: 300 tons
280-TON FLOT MILL, at mine
Mill Frm: Tom McAllister
Assay: James Wright

SOUTHWESTERN TALC CORP

Box 582, Llano
Pres: Wm. Hegley
VP & Sec: Clinton G. Brown, Jr.
VP & Treas: Fred C. Gross
Asst Sec. & Office Mgr:
Tracy Ward
MINE, Sierra Blanca, open
pit, commercial talc
Gen Mgr: J. B. Upton (Van Horn,
Tex.)

ROLL MILL, Llano

Prod: 165 tons
Mill Supt: Albert Fox
Cap: 180 tons of talc daily

SUNRISE MNG CO

Simons Bldg., Dallas 1
Pres: A. P. Simons
VP: Willard C. Lacy,
T. K. Shoemaker
Sec-Treas: Roy R. McKee
(See Ariz.)

TEXAS BARITE CO, INC

300 Harrington St., Houston 9
Pres: Donald F. Graham
200-TON MILL, Eagle Pass, Ba
Prod: 100 tons daily
Supt: E. Z. Wahl
GRINDING PLANTS, Harrie,
Maverick Co.

TEXAS GULF SULPHUR CO

New Gulf
BOLING DOME, New Gulf
sulphur
MOSS HUFF, Liberty, sulphur
SPINDLETOP MINE, Beaumont,
sulphur
FANNETT MINE, sulphur,
undergr.
Gen Mgr: H. W. Strickland
Asst Gen Mgr: C. L. Orr &
A. F. Zemanek
Prod: 6000 long tons per day
(See N. Y.)

TEXAS TALC CO

7634 2nd Ave., Dallas
ROSSMAN MINE, Hudspeth
County, talc

TWIN STAR INDUSTRIES INC

1111 S. Congress, Austin
Pres: W. B. Pratt
VP: John S. McNamee, Jr.

**BROWN WHITE MINE, open pit,
talc**

PARKER MINE, guano,
Under devel
(See Ariz., ND)

U. S. GYPSUM CO

300 W. Adams St., Chicago, Ill.
MINE, Sweetwater, Nolan
County, open pit, gypsum
Works Mgr: T. H. Kassner
(See Calif., Colo., Conn., Ill.,
Ind., Iowa, Mass., Ohio, SD,
Utah, Va.)

WAH CHANG CORP

233 Broadway, New York 7, NY
TIN SMELTER, Texas City
Super: T. S. Mackey
(See Calif., Colo., N. Y.)

WESTERN TALC CORP OF HOUSTON

Allamore
MINE, Hudspeth County, open
pit, talc
Under devel

UTAH**A & W MNG CO**

5 T. H. McPhee, Box 535,
Moab
MINE, U₃O₈

ABERNATHY MNG CO

195 N. First, West, Moab
ATOMIC KING #2, Canoe
Springs Mng Dist., San Juan
Co., undergr., U₃O₈
Mine Oper: J. Abernathy
Prod: 10 to 30 tons daily
Under devel

ADAIR, IVOR

Box 382, Moab
MINE, U₃O₈

ALAMCO INCORP

620 Kennerly Bldg.
Canton, Ohio
MINE, in Utah, U₃O₈

ALLEN, PAUL K

Hickman
MINE, U₃O₈

ALLIED MISSION OIL CO

1042 Milam Bldg., San Antonio
Texas
MINE, U₃O₈

ALTA UNITED MINES CO

306 Phillips Petroleum
Bldg., Salt Lake City 1
Pres: J. Kasteles
SOUTH HETLA MINE, Pb, Zn

AMERICAN BLOCK CO

1544 S. Industrial Rd.
Salt Lake City
MINE, Fe

AMERICAN GILSONITE CO

Municipal Airport, PO
Box 15, Salt Lake City
Pres: E. F. Goodner
VP-Prod Mgr: F. E. Nelson
Sec-Treas: T. H. Owen
BONANZA MINES, Bonanza
undergr., gilsonite
Mine Supt: Paul Borden
Mine Frm: L. F. Williams
Mine Eng: R. F. Dewey
Prod: 176 tons
(See Colo.)

AMERICAN MUD & CHEMICAL CORP

Canonville
Pres: W. T. Piper
MINE, Bentonite
Under devel
MILL, at mine

AMERICAN SMELT & REFIN CO

500 Crandall Bldg.
Salt Lake City 1
WESTERN DEPARTMENT
Gen Mgr: W. G. Rouillard
Office Mgr: L. K. Nicholson, Jr.
WESTERN MINING DEPT.,
600 Crandall Bldg.
Mgr: J. F. Frost
Senior Geol: W. P. Hewitt
Ch. Geophys: R. J. Lacy

Milg Eng: Norman Weiss
(See Ariz., Calif., Colo., Idaho,
Ill., Ind., Mont., Neb., N. J., N.
Mex., N. Y., Tex., Wash. &
Federal Mng & Smelting Co.,
Mo.)

AMERICAN ZINC, LEAD & SMELTING CO

1600 Paul Brown Bldg.
St. Louis 1, Mo.
Western Geol: Hiram F. Mills
2802 E. 3135 South, Salt Lake
City
(See Ariz., Ill., Mo., N. Mex.,
Ohio, Okla., Tenn., Tex., Wash.,
Wisc.)

AMERICAN STAR MNG CO

608 Dooly Bldg., Salt Lake
City
Pres: Cecil Finch
VP: Cecil Finch, Jr.
Sec-Treas: W. W. Watson
AMERICAN STAR MINE,
Eureka, Ag., Au., Cu., Pb

AMPET CORP

523 Colorado Bldg., Denver 3
Pres: R. A. Gus Davis
VP: Robert J. Paul
Sec-Treas: A. O. Brehmer
VANADIUM KING 1 & 3, Temple
Mt., Emery County, undergr.,
U₃O₈, V₂O₅
Gen Mgr: R. A. Davis
Mine Supt: Jay Gillies
MILL, Green River
(See Ariz., Colo.)

ANATIAN CORP

Box 13, Bountiful
Pres: Homer Hansen
VP: Clyde Hemmerli
Sec: Ray Clark
Treas: Myron Hamilton
Purch Agt: E. D. Poonen
MINE, undergr., U₃O₈, V₂O₅

ANSCHUTZ DRILLING CO INC

1411 Mile High Center Bldg.
Denver, Colo.
JIMBO BOB MINE, 20 mi NE
of Monticello, undergr., U₃O₈
Geol: Fred C. Hohne
Mine Supt: A. A. Hollen
Prod: 20 tons per day
(See Colo., Wyo.)

ARENZ MNG VENTURE

870 1st Security Bldg.
Salt Lake City
Pres: Samuel S. Arenz
Treas: Frank H. Anderson
(See Ore.)

ATKINSON EXPLOR CO

2501 Liberty Bank Bldg.
Oklahoma City, Okla.
MINE, in Utah, U₃O₈

ATOMIC RESOURCES CORP

PO Box 458, Monticello
REE, DISMONT SLIMES,
ROANOKE, SUNSET, VALLEY
VIEW, WATER FALL ORP
MINE, San Juan Co., U₃O₈

B. C. MNG CO

2 Brethower Bldg., Montrose
Colorado
MINE, U₃O₈

B. W. & H. GOLD & SILVER MNG CO

Richfield
MINE, Soviet Cr., Au., Ag

BADE, WM J

Box 764, Green River
URANIUM & WOODRUFF
GRP MINES, Garfield Co.,
U₃O₈

BARLOW, WILLIAM S

Dove Creek, Colo.
MINE, San Juan Co., U₃O₈
(See Colo.)

BARRETT MNG CO

Box 305, Dove Creek, Colo.
MINE, San Juan Co., U₃O₈
(See Colo.)

BASTIAN, CALVIN

Green River
MINE, U₃O₈

BEAR CREEK MNG CO

407 Surety Life Bldg.
1935 S. Main St., Salt Lake
City 15
Pres: C. H. Burgess

MINE, East Tintic Dist, Au, Ag, Cu, Pb, Zn
(See N Y & Kennecott Copper Corp, Ariz, N Y)

BENTLEY, MAXWELL
351 S State, Salt Lake City
MINE, U₃O₈

BESTWALL GYPSUM CO
130 E Lancaster Ave
Ardmore, Pa

GYPSUM MINE, Sigurd
(See Iowa, Kans, Mich, N Y, Pa, Tex)

BINGHAM EMPIRE MNG CO

235 S 5th East
Salt Lake City 2
VP: Philip S Knight
Sec-Treas: Gen Mgr:
Richard Knight
BINGHAM EMPIRE MNG CO
MINE, Bingham Canyon,
undergr, Cu
Idle

BLAKE & NIELSON
Box 375, Monticello
MOE MINE, San Juan Co,
U₃O₈

BLANDING DRILLING CO
Grant Shumway
Doug Davis, Box 431,
Blanding

FRACTION CLAIM, OXIDE & SHADY MINES, San Juan Co,
U₃O₈

BLUE CREEK MNG CO
PO Box 1648, Grand
Junction, Colorado
Part: D G Sen, J R Munro,
E L Hess

BLACK HAT URANIUM MINE,
Paradox dist, U₃O₈
Under devel

BONNEVILLE, LTD
540 W 7th South St
Salt Lake City 1
Chmn of Bd: W L Bradley
VP: Q A Shaw, Jr
Sec-Treas: G B C Mathison
Purch Agt: W R Thomas
MINE, Wendover, KCl
Gen Mgr: J R Ecton
Gen Supt: J R Wiley
Met: P Haderiga
Chem: C Andrew, H C Ballard
1,000-TON FLOT MILL

BOYLES BROS DRILLING CO

1818 E Main St
Salt Lake City
Pres: R T Goldsworthy
VP: B L Baker
Sec: A F Goldsworthy
Treas: V L Stevens
Purch Agt: A P Tacker
Comptroller: E D Haddon
(See N Mex)

BRIDGER, JACK INC

130 W Main St,
Grand Junction, Colo
SCH SEC 1 & BRIDGER JACK
MINES, San Juan Co, U₃O₈
(See Colo)

BRISTOL SILVER MINES CO

218 Felt Bldg
Salt Lake City 11
Pres: J H Buehler
VP: Byron S Hardie
Sec-Treas: C M Christensen
Purch Agt: Hoyt Adair
(See Nev)

BULLION MONARCH MNG CO

Idaho Falls, Idaho
Or c/o VANADUM CORP OF
AMERICA, 420 Lexington
New York 17, New York
FARMER JOHN MINE,
Marysville dist, Platte County
U₃O₈
(Leased to VCA)

CAL URANIUM CO

152 E Center St, Moab
MINE, San Juan Co, U₃O₈

CAMPBELL, W B

Moab
COPPER PENNY & BONAZZA
2 MINES, San Juan Co,
U₃O₈

CAPITAL-SEABOARD

CORP
Box 1847, Farmington,
N Mex
Pres: Joseph H Corbin

Exec VP & Gen Mgr:
Chas W Yetter

Sec: Wm A Pope, Jr
Treas: Howard L Corbin
TAYLOR REID #1, 2, Ojalo
San Juan County, undergr,
U₃O₈, V₂O₅
Mine Supt: James Donini
Prod: 15 tons
(See Ariz, Idaho, Mont, N Mex,
Tex)

CARDIFF MNG & MLC CO

Box 9004, Denver 16, Colo
Pres-Gen Mgr: E M Stone
VP-Treas: H S Dickson
Purch Agt: Matt Martinson
CARDIFF MINE, Salt Lake
County, undergr, Ag, Pb, Zn
Geol: G L Fairchild

CARIBOU MNG CO

740 McClelland Ave
Salt Lake City 3
NOTCH & BUGS MINES, San
Juan Co, U₃O₈

CARLISE URANIUM CO
c/o Curtis Jones, Blanding
MINE, U₃O₈

CENTENNIAL DEVEL CO

Eureka
Pres: Harold B Spencer
VP: James Quigley
Sec-Treas: Robert E Watt
Ch. Mgr: Frank McCabe
Fid Eng: E Steele McIntyre
(See Ariz)

CHESLEY & BLACK

Delta
MINE, Juab Co, CaF₂

CHIEF CONSOL MNG CO

508 Dooly Bldg
Salt Lake City
Pres & Gen Mgr: Cecil Fitch, Jr
VP & Sec-Treas: W W Watson
CHIEF NO 1, Eureka
undergr, Zn, Pb, Ag, Au
Idle

CLIFF DEVEL & EXPLOR CORP

4843 Hyland Dr
Salt Lake City
Pres & Gen Mgr: W C Dunham
Actg VP: Earl Kidd
Sec-Treas: Doris T Dunham
SHOWERS MINE, Silver City,
undergr, Cu, Pb, Zn, Au
THE WELL, Rush Valley,
undergr, Pb, Cu, Ag, Au
Geol: J C Dunham

CLIMAX URANIUM CO
(Subsidiary of AMERICAN METAL
CLIMAX)

PO Box 1881
Grand Junction, Colo
Pres: Frank Crobaugh
VP-Gen Mgr: A M Mastrovich
Consultant: E J Duggan
Mgr of Mines: L J Brewer
Ch Geol: Philip Donnerstag
Asst Treas: A R Eichenbary
Asst Sec: J D Carnahan
MINERAL POLAR #22,
CACTUS RAT, CANE CREEK,
Grand County, Utah
U₃O₈ prod & development
MORENO SCHOOL SECTION,
San Juan County
(See Ariz, Colo, N Y)

LEO CLINE & CO

S Robert L Parent,
421 Glenwood, Grand Junction
Colorado
MINE, at San Rafael Reef,
Emery Co, U₃O₈
(See Colo)

COLORADO CONSOL MINES CO

1114 Walker Bank Bldg
Salt Lake City
Pres: H E Raddatz
VP: Harriet D Travis
Sec: Glen Hardy
Gen Mgr: M D Paine
COLORADO CONSOLIDATED
MINE, (Leases) Dividend,
2 mi SE of Eureka, undergr,
Pb, Au, Ag, Cu
Idle

COLORADO FUEL & IRON CORP

Pueblo, Colo
Pres: A F Franz
VP: J J Martin
Sec: D C McGraw
Gen Mgr: R R Williams, Jr
Purch Agt: L C Rose

BLOWOUT, COMETOCK & DUNCAN MINES

Cedar City, open pit, Fe
Res Eng: John Robertson, Jr
Prod: 3000 tons
(See Colo, Wyo)

COLUMBIA IRON MNG CO

(Subsidiary of U S STEEL CORP)
120 Montgomery St
San Francisco 6, Calif
MINES, Iron Mts & Desert
Mound 20 mi W of Cedar City,
surface, Fe
Gen Supt: G D MacDonald
Mine Eng: J D Quinn
CRUSHING & SCREENING
PLANTS, Desert Mound & Iron
Mts
(See U S Steel, Alaska, Ala,
Calif, Minn, Pa, Tenn, Utah,
Wyo)

COL-U-MEX URANIUM CORP

615 Simms Bldg
Albuquerque, N Mex
Pres: Tom F Harrington
VP: Ed S Ketchum
DOROTHY MAY MINE, Big
Indian Mng dist, San Juan
County, undergr
Gen Mgr: William R McCormick
Asst Gen Mgr: Russell L Wood
Gen Supt: Robert M Hurst
Geol: Robert R Ward
Mine Supt: David E Artell
Prod: 100 tons
(See N Mex)

COMBINED METALS

REDUCTION CO
Box 150, Salt Lake City 10
Pres & Gen Mgr: E H Snyder
VP: E H Snyder, Jr
W H Kelsey
Sec: C M Christensen
Treas: A C Merrill
Purch Agt: E G Black
Gen Mgr: Paul Gemmill
BAUER PLANT OPRS, Stockton
undergr, Pb, Zn
Gen Supt: I C Droubay
Research Met: Corwin Likens
Mech Eng: Macestin L Ord
Mill Supt: Winford Hector
Met: Rex Hayes
Office Mgr: Frank Andrews
1500-TON FLOT MILL,
Bauer Plant
Idle
(See Nev)

CONRAD URANIUM CO

5542 S 1700 West
Salt Lake City
Sec: C J Mathews
CONRAD #3 MINE, San Rafael
dist, Emery County, U₃O₈
Under devel

CONSOL EUREKA MNG CO

217 Kearns Bldg
Salt Lake City 1
Pres: James E Hogle
VP: J C Johnson
Sec-Treas: L J Lerwill
Gen Mgr & Purch Agt:
Sherman B Binkley
(See Nev)

CONTINENTAL

MATERIALS CORP
PO Box 1550, Grand Junction
Colo
Pres: Willard Gidwitz
Sec: Max H Braun
Bd Chmn: Gerald Gidwitz
CONTINENTAL NO 1, LaSal
undergr, U₃O₈, V₂O₅
Gen Supt: C H Reynolds
Geol: H M Smithson,
Gerald Brooks
Met: James C Terrahan, Jr
Mine Supt: Clarence O Cox
Prod: 100 tons
(See Colo, Wyo & Woodmont,
Utah)

COX, EMERALD L

148 E 100 South, St. George
APEX MINE, Tuisagubet Dist
Co, Pb, Ag

CUPRIC MINES CO

38 Exchange Place
Room 29, Salt Lake City 11
Sec-Treas: David H Bullough
NEWHOUSE-CACTUS MINE,
San Francisco dist, Beaver
County, open pit development
Cu

DAVIS, R L & BESSIE
Thompson
MINE, U₃O₈

DENTON, F J
PO Box 543, Blanding
MINE, U₃O₈

DEVEL-CO MINERALS

DEV CO
Box 306-C, Greenriver
LUCKY STRIKE & VAGABOND
1 MINES, Emery Co, U₃O₈

DEER TRAIL MINES

Marysville
Sec-Treas: Carlyle Hunt
MINE, Platte Co, Cu, Pb, Ag
Under devel

DELTA MNG CO & TRI STATE MNG CO
2229 S Kentucky, Evansville
MINE, U₃O₈

DIAMOND URANIUM CORP

510 Felt Bldg
Salt Lake City
LEMUEL LITTLE MAN #2
MINE, open pit, U₃O₈

DICKERSON, WIMER & FOGUE

473 S Tuaher, Moab
MINE, U₃O₈

DRAGON CONSOL MNG CO

c/o L J Eliason
International Smelting &
Refining Co, RFD #1
Tomb
Pres: Roland B Mulchay
VP: Richard Knight
Sec-Treas: L J Eliason
Purch Agt: T H Davis
DRAGON MINE, 4 mi S of
Eureka, undergr, surface
halloysite clay, Au
Geol: R B Mulchay
(Leases, Filtril, Inc, Salt
Lake City)

DUNKEL, DALE

PO Box 313, Cisco
MINE, U₃O₈

EAGLE & BLUE BELL MNG CO

608 Dooly Bldg
Salt Lake City
Pres: Robert Watt
Sec-Treas: Audrey L
Christensen
EAGLE & BLUE BELL MINES,
Eureka
Pb, Zn, Ag, Au
Idle

EKKER, HAROLD

Loa,
MINE, U₃O₈

ELLINILL MNG INC

% Bill Wood, Blanding
MINE, San Juan Co, U₃O₈

EMPIRE MINES CO

815 Kearns Bldg
Salt Lake City
SPY & BLACK JACK MINES,
Juab County, Au, Ag, Cu
Idle

ESCALANTE MNG

VENTURE
870 First Security Bldg
Salt Lake City
Treas: Frank H Anderson
MINE, Enterprise, undergr,
Ag, Pb
Under devel
Own: The Chief Consolidated
Mng Co
Armet Co

EVEN ODDS, INC

Monticello
MINE, U₃O₈

EUREKA LILLY CONS MNG CO

1114 Walker Bank Bldg, Salt
Lake City 1
Pres: H E Raddatz
VP: Harriet D Travis
Sec: Glen Hardy
Gen Mgr: M D Paine
EUREKA LILLY MINE,
Dividend, undergr, Au, Ag, Cu
Pb,
Idle

EUREKA STANDARD

CONSOL MNG CO
1114 Walker Bank Bldg
Salt Lake City
Pres: H E Raddatz
VP: Harriet D Travis
Sec: Glen Hardy
Treas: Purch Agt: M D Paine
EUREKA STANDARD & DUMP
MINES, Utah County, Au
Idle

EVEN-ODDS, INC

Monticello
Pres: J L Menlove
FENTE-LEE LODGE & Sch
Sec: H MINES, San Juan Co
U₃O₈

EXCALIBUR URANIUM CORP

PO Box 1201, Santa Fe, N Mex
Treas: Z E Henderson
COTTONWOOD #6 MINE,
Grand Co, U₃O₈

FEDERAL URANIUM CORP

1370 S 3rd W St
Salt Lake City
Chmn of Bd: Nels W Stalheim
Pres: R W Keyman
VP: Bruce W Odum
Sec-Treas: Donald V Feters
Purch Agt: J A Grive
VARIOUS MINES, U₃O₈, Ag
Pb, Zn, Cu
Gen Supt: R Messerly
Ch Eng-Geol: A B Newman
Gen Mill Supt: Arthur A Griffith
Under devel
(See Idaho, N Mex)

CON FENNING

4041 S 2nd, Salt Lake City
MINE, U₃O₈

FERRON URANIUM CO

% Bob Hanni, Green River
GREEN VEIN & LUCKY STRIKE
MINES, U₃O₈

FERRON URANIUM MNG CO

Price
MINE, U₃O₈

FOUR CORNERS OIL & MINERALS CO

1700 Broadway, Denver 2,
Colo
SAN RAFAEL GROUP, Green
River, PO Box 641, undergr,
U₃O₈

Mine Supt: Walter Bronson

LA SAL CANYON MINE, Box
15, Monticello, undergr,
U₃O₈

Mine Supt: Walter Bronson

Prod: 150 tons per day

(See Colo, Wyo & Largo
Uranium Co, N Mex)

FRANCIS, LYLE G

PO Box 204, Moab
MINE, U₃O₈

FRISCO SILVER LEAD MNG CO

38 Exchange Place
Salt Lake City
Pres: Robert A Hunt
Sec: David H Bullough
MINE, 25 mi W of Milford
undergr
Idle

FRONTIER OIL & MNG CO

2948 North Ave, Grand
Junction, Colo
Mgr: S P Flyborn
YELLOW BIRD MINE, Grand
Co, U₃O₈
(See Colo)

GARFIELD CHEMICAL & MFG CORP

610 Kearns Bldg, Box 2068
Salt Lake City 10
Pres: F C Green
Sec-Treas: J P O'Keefe
Purch Agt: T B Rees
Supt: R McNally
(Managed by Kennecott Copper
Corp)
UTAH SMELTER, Garfield
1000-TON Sulfuric acid plant

GAUS BROS

PO Box 45, Lund
MINE, U₃O₈
Under devel

GLENNY-CUTLER MNG CO

764 Newhouse Bldg.
Salt Lake City
COW PASTURE CLMS, ELK
RIDGE CLMS, GEORGE
GORDO & MERLE, GOOSE-
BERRY LAKE CLMS, JACK
CLMS, KING NO 2 CLM, SAW
MILL CLMS & WHITE CANYON
CLMS, San Juan Co, U₃O₈
ORA & LITTLE SCOTTY,
Wayne Co, U₃O₈
VANADIUM KING CLMS,
Emery Co, U₃O₈

GRAMLICH EXPLOR CO

Box 435, Moab
Pres & Gen Mgr:
J W Gramlich, Sr
VP & Asst Gen Mgr:
J W Gramlich, Jr
Sec-Treas & Gen Supt:
Philip F Gramlich
BLUE JAY & SAN JUAN MINES,
undergr, U₃O₈, V₂O₅
Heidi Duff Whaley
Mine Eng: Hub Newell
Under devel

GRAT WESTERN MINES CO

Box 36, Foothill Stn
Salt Lake City 8
Pres & Gen Mgr: Richard Knight
VP: W S Brimhall
Sec-Treas: Philip S Knight
110 CLAIMS, Snake Creek Dist,
American Fork Mng Dist, open
pit, undergr, Co, Au, Ag, Pb
(Under lease to Utah Constr
Co, Calif)
Under devel

GREEN RIVER OIL & URANIUM CO

26 W Broadway
Salt Lake City
Pres: Falias M Kelly
Sec-Treas-Gen Mgr:
Austin B Smith
(See Colo, Wyo)

GREGG, JE

PO Box 778, Moab
MINE, U₃O₈

GRISMAN, TED

Green River
MINE, U₃O₈
Under devel

GULF STATES URANIUM CO

5245 S State St, Murray
MINE, San Juan Co, U₃O₈

HAMLIN EXPLORATION & MNG CO

PO Box 32, Eureka
Pres: W C Hamlin
VP: R G Hamlin
Sec-Treas: C H Hamlin
Beryllium
Under devel

HAFEN, RALPH

Moab
MINE, U₃O₈

HANNERT, W H

4687 Idlewild Rd,
Salt Lake City
MINE, U₃O₈

HANSON, MELVIN

PO Box 356, Hot Springs,
S Dak
MINE, U₃O₈

HAPPY SURPRISE MINES

PO Box 218, Blanding
MINE, U₃O₈

HECLA MNG CO

Moab
Pres: L J Randall
Mgr of Mines, W H Love
RADON MINE, Big Indian dist,
near Moab, undergr, U₃O₈
Mine Supt: Philip Lindstrom
Mine Frm: Grant Balick
Mine Eng: Vernon Davis
Prod: 150 tons
(See Idaho)

HIDDEN SLENDOR MNG CO, THE

First Security Bldg
Salt Lake City
Pres: A Payne Kibbe
VP-Gen Mgr: Dale I Hayes
VP: David A Stretch
Mng Engr: R L Brittain
Sec-Treas: Edward R Farley, Jr
Purch Agt: Jack E Hopfenbeck
Controller: Ray Gough
Staff Geol: Ray E Wimber
Ch Geol: Edwin T Wood

FAR WEST MINE, Big Indian

Wash, San Juan County,
undergr, U₃O₈
Geol: William E Loring
Dist Eng: J M Newman
Master Mech: Charlie Wilam
Mine Supt: John R Mullen
Mine Frm: Joe D Bierschled
Mine Eng: Edward T Dwyer
Prod: 550 tons per day
COLUMBIA SHAFT, Big
Indian Dist, undergr, U₃O₈
Mine Supt: Harry S Pollard
Prod: 300 tons per day
IKE SHAFT, Moab, undergr,
U₃O₈
Mine Frm: Albert F Edwards
Prod: 300 tons per day
ULA MINE, Hot Canyon Dist,
San Juan Co, U₃O₈
Prod: 300 tons
(See Colo, Moab, Wyo, N Mex)

HILL, EVERETT & MARIE

Star Route, Hot Springs,
S Dak
MINE, U₃O₈

HOMESTAKE MNG CO, UTAN DIV

100 Bush St, San Francisco
California
NORTH ALICE MINE, Big
Indian dist, San Juan County,
undergr, U₃O₈
Gen Mgr: Gordon M Miner
Gen Supt: Edw F Jacobson, Jr
Asst to Pres: Paul C Henkel
Mine Frm: Frank Boggie
Eng: Walter Weld
Prod: 275 tons
(See Calif, N Mex, S D, Wyo)

HORN SILVER MINES CO

39 Exchange Place
Salt Lake City
Pres: D M Draper, Sr
VP: Robert A Hunt
Sec-Treas: D H Dullough
HORN SILVER MINE, Milford
Au, Ag, Pb, Zn
Idle

HUNT, KAY

Hanksville
KING GROUP MINES, U₃O₈
Gen Mgr: R C Harvey

IBEX GOLD MINING CO

Box 36, Foothill Stn
Salt Lake City 8
VP: Philip S Knight
Sec-Treas & Gen Mgr:
Richard Knight
IBEX MINE, (Leased) near
Delta, in Drum Mt dist,
undergr, Cu, Au, Ag
Idle

IBEX URANIUM INC

60 E 3rd South, Spanish Fork
MINE, U₃O₈

INDEX DALEY MINES CO

118 N Main St
Salt Lake City 16
Pres-Purch Agt:
Charles S Woodward
VP: Glen A Finlawson
Sec-Treas: R W Edmunds
INDEX MINE, Wells, Nev,
undergr, Ag, Pb, Cu, Au
Gen Mgr: Charles S Woodward
Gen Supt-Mine Supt:
George A Rich
Under devel
(See Nev)

INDUSTRIAL URANIUM CO

273 So Main, Salt Lake City
Pres: Robert M Schuchack
VP: Jas D Moyle
Sec-Treas: Alford M Burton
MOONLIGHT, STARLIGHT,
WALTER CHIEF, & SUNLIGHT
MINES, P O Box 426, Mexican
Hat, undergr, open pit, U₃O₈
V₂O₅, Cu
Asst Gen Mgr: C R Hanney
Gen Supt: John Bortert
Prod: 250 tons

INDUSTRIES & MINES INC

85 Broad St, New York 4
New York
DEL MONTE, DABY JUNE,
CONGRESS, EAGLES &
GRIFF MINES, Henry Mts,
undergr & surface, U₃O₈
V₂O₅, Au, Cu, Fe
Gen Mgr: James M Knapp

Asst Gen Mgr: Edward Homake

Geol: Stuart St Clair
Mech Eng: Wm Kessen
Prod: 1,800 tons & developing
Kee NY

INTERNATIONAL OIL & METALS CORP

512 E Second S
Salt Lake City
Pres: Gordon C Holt
VP: Louis H Segreave
Sec: Judith F Whitmer
Treas: Devereil Diamond
DIVIDE MINE, Big Indian dist,
San Juan County, undergr,
U₃O₈
Prod: 10,000 tons per year

INTERNATIONAL SMELTING & REFIN CO

Kearns Bldg, Salt Lake City
Purch Agt: T K Davis
Counsel: Robert G Dwyer
TOOLEE PLANT, Tooele
Mgr: W J McKenna
Asst to Mgr: G A Burt
Gen Supt: E W Steinbach
Pers & Safety: T K Voyer
Ch Elec: Harry Gillespie
Plant Eng: Earl House
(See N Y, Ariz, N J)

JAY JAY MNG CO

& Dr J J Parker, 732 28th Rd
Grand Junction, Colo
MINE, U₃O₈

JEN, INC

Box 458, Moab
Chmn of Bd: E H Snyder
Pres: C E Tuttle
VP: E H Snyder, Jr
Sec-Treas: C M Christensen
CORD MINE, Big Indian Dist,
San Juan County, U₃O₈
Gen Supt: Wm J Franklin
Mine Frm: Herbert K Jones
Prod: 450 tons per day

JOHNSON, RAY H

Gen Del, Green River
MINE, U₃O₈

ISBELL CONST CO

Box 2381, Reno, Nev
HAPPY JACK URANIUM MINE,
Fry Canyon, contract mng for
Texas-Zinc Minerals Corp
Supt: Dick Strand
Under devel
(See Ariz, Idaho, Nev, Wash)

JOLLY JACK URANIUM

823 Judge Bldg
Salt Lake City
PROPERTIES, White Canyon
area, Big Indian dist &
Garfield County, U₃O₈
Mine Supt: Vernon R Aiken
(See Calif)

KELLEY, EARL M

PO Box 793, Fruita, Colo
MINE, U₃O₈

KENNECOTT COPPER CORP, UTAH COPPER DIV

P O Box 1650, Kearns Bldg
Salt Lake City 10
Pres: C R Cox
VP: F N Williams
Treas: E S Hann
Gen Purch Agt: L W Shelton
Gen Mgr, Utah Copper Div:
F C Green
Gen Supt of Oper, Utah Copper
Div: J C Landenberger
Dir, Indust Rel: J E Petersen
Dir, Communications:
D C Houston
Dir, Safety & Fire Control:
E K Olson
Purch Agt: T B Ross,
Dir, Public Rel: W F Ballmer
Div Controller: J P O'Keefe
Asst Div Comm: O C Madsen
Ch Eng: A J Thull, Jr
Ch Mine Acct: S W Jacques
Ch Mill Acct: C B Brooks
Storekeeper, Mills: H W Naylor
Storekeeper, Mine: A J Roberg
Ch Refinery Acct: H L Erickson
Ch Eng, Mills: R P Anderson
Master Mech, Mine:
S A Gudmundsen
Supt Maint, Mills: L Baldee
Master Mech, Mills: R L Dean
Traffic Mgr: A L Pratt
CENTRAL POWER STATION,
Garfield
Ch Eng: J H Harkins
MILLS ONE HAULAGE,
Garfield

Supt: L S Mills

BINGHAM MINE, Bingham
Canyon, Cu, Mo, Au, Ag,
Selenium
Mine Supt: V S Barlow
Maint Dept Supt: J A Norden, Jr
Oper Dept Supt: Ray F Gough
Employment Dir: L O Hamlin
Safety Eng: Ross Pino
Prod: 60,000 tons
MAGNA & ARTHUR MILLS,
Garfield

Mill Supt: P M Ensign
Dir Quality Cont: C O Quigley
Supt, Magnat: T J Hubbard
Supt, Arthur: Neil Plummer
Employment Dir: H J Brown
Ch Elec Eng: R J Corfield
Safety Eng: R L Erickson
Ch Met Eng: A O Johnson
Ch Anal Chem: A Fraser
UTAH REFINERY, Garfield,
Supt: W H Burt
Refin Dept Supt: C A Zeldin
Plant Eng: C Beck
Master Mech: R F Johnson
GARFIELD WATER &
IMPROVEMENT CO, Garfield
Supt: C R Haylor
(See Ariz, Nev, N Mex, N Y &
Bear Creek Mng, Utah)

KENO MNG & MLG CO

Box 36, Foothill Stn
Salt Lake City 8
VP: Philip S Knight
Sec-Treas & Gen Mgr:
Richard Knight

IDEX MINE, (Leased), Detroit
Mng Dist, north end of Mineral
Mt Range, undergr, Ag, Pb
Idle

KIN'EL URANIUM CORP

2705 A S Fremont, Alhambra,
Calif
Pres: Clarence King
VP: Soren Nelson
Sec-Treas: D M King
BLUE GOOSE #1 and #2, under-
gr, U₃O₈
Idle

KERN COUNTY LAND COMPANY

870 1st Security Bldg
Salt Lake City 11
Consulting Geol:
Sidney S Alderman, Jr
Mgr, Minerals Dept:
Wm T Gruswald
(See Ariz, Calif, Idaho)

KNAPP URANIUM DEVEL

555 E 5600 St, Salt Lake City
Pres: Clyde J Knapp
(Mines leased out)

LA SAL MNG & DEVEL CO

Box 563, Moab
LA SAL MINE, Big Indian
Dist, San Juan County, undergr,
U₃O₈
Mine Supt: Gordon Miner
Asst Mine Supt: E F Jacobson, Jr
Mine Frm: Donald Weissman
Mine Eng: Walt Weid
Prod: 300 tons
(See Colo)

LA SHUBERCO MNG CO

Box 303, Marshfield, Wisc
Pres: Grant Johnson
VP: W W Mittelstadt
Sec: Fred Wolf
Treas: Dan Hosok
LITTLE EVA MINE, Yellow Cat
dist, Grand County, undergr,
U₃O₈, V₂O₅

LA VERKIN MNG CORP

105 N Main St, Bountiful
MINE, U₃O₈

LONE STAR MNG & DEVEL CORP

235 Korber Bldg,
Albuquerque, N Mex
NORTH WASH MINE #1, Garfield
Co, U₃O₈
(See N Mex)

LYNN MINING CO

c/o Allen Lynn, Box 407
Grantville
MINE, Fe
(See Nev)

M R & B MNG & EXPL CO

Box 555, Green River
Pres: R F Magor, Jr
VP & Gen Mgr: R F Magor III
Sec: H J Bleakley
RED BONE & LITTLE LILL
MINE, undergr, U₃O₈

MCCULLAN, J L & LOIS

Thompson
MINE, Yellow Cat Dist, U₃O₈
Under devel

McFARLAND & HULLINGER

Box 238, Tooele
Partners: F G McFarland
& S R Hullinger
(See Ariz)

MCNEIL & HUGHES

1303 S Hill, Oceanside
Calif
MINE, in Utah, U₃O₈
Under devel

MECCA MNG CO

705 Newhouse Bldg
Salt Lake City
Sec: R A Glenn
MINE, Tooele Co, Pb, Zn
Under devel

MECHAN, VICTOR W

649 Briten Court,
Salt Lake City
MINE, U₃O₈

MESA MNG & DRILLING

Blanding
MINE, U₃O₈

MICRO COPPER CORP

Marshall Court, Moab
Pres: Richard N Moiler
Sec-Treas: Ellis R Coon, Jr
(See Colo)

MILLER HILL MNG CO

PO Box 37, Provo
Pres: Philip S Knight
MINE, undergr, open pit, Au
Au, Pb, Zn
Under devel
(Leased to Utah Constr Co, Calif)

MINERALS ENGINEERING CO

PO Box 1931, Grand Junction
Colo
Pres: Blair Barwell
Mgr: Allan T Burwell

13-TON APT REF MILL

Supt: A T Burwell
Asst Mill Supt: Donald J Lemmon
(See Mont)

MINERALS PROD CO

440 N Tn, Grand Junction
Colo
Part: D V Mauro, DE Kaasch
Treas: J R Havill
WEE HOPE MINE, Fry Canyon,
undergr, U₃O₈, Cu
Mine Supt: Fred Brunette
Prod: 10 tons

MNG BUREAU OF ANALYSIS

2506 Thomas, Durango, Colo
Pres: George R Grandbois
BELL MINE, Fry Canyon,
undergr, U₃O₈, Cu
Gen Mgr: G Grandbois
Asst Gen Mgr: R Kahler
Geol: G R Grandbois
Prod: 25 tons daily
(See Colo)

MOAB DRILLING CO

52 E Central St, Moab
Pres: Charles Steen
Gen Mgr: Max D Pierson

DIAMOND DRILLING

MOHLCRAFT INDUSTRIES INC

(FORMERLY PIUTE URANIUM CORP)
8913 Olympic Blvd, Suite 203
Beverly Hills, Calif
Pres: Sigmund Janas
VP: John F Hebert
Sec-Treas: A P Meyers
PROPERTIES, Beaver County
Pb, Zn

MOKI MNG CO

& Vari C Ritchie, Desert
Bldg, Salt Lake City
MINE, San Juan County, U₃O₈

MONOGRAM URANIUM & OIL CO

205 Petroleum Bldg
Grand Junction, Colo
Pres: Ray Baxter
VP: Howard F Carr
Sec-Treas: Geo Dills
DESERT MOON MINE, Green
River, undergr, U₃O₈, V₂O₅
Mine Supt: Joseph H Trudgen
Prod: 35 tons
(See Colo)

MONTE CRISTO URANIUM CORP
1003 Continental Bank Bldg
Salt Lake City
Pres & Treas:
Richard Minasian
VP: Donald Nelson
Sec: Clarence C Heslin
MONEY BEE 1 & 2 MINES
Cane Springs Canyon, San Juan
County, undergr, U₃O₈, V₂O₅
Under devel
(Oper under lease by the
Skidmore Mng Co of Dolores,
Colo)

MOSCOW SILVER MINES CO
207 Atlas Bldg,
Salt Lake City
MINE, Beaver Co, Ag

MOUNTAIN MINERALS INVEST CO
Congress Hotel, 2nd S &
State, Salt Lake City
Pres: Donald Gilman
VP: Richard Hunt
Sec-Treas: Marie K Reeves
POCO BUENO MINE, Gold
Hill, Tooele County, undergr,
Ag, Pb, Zn, Au, Cu
Idle

MYSTERY-SNIFFER MINES INC

Beaver
Pres: W R O'Keefe
VP: L E Hestman
Sec-Treas: B L Flood
Purch Agt: R E Lee
MYSTERY-SNIFFER MINES,
16 mi NE of Beaver, undergr,
U₃O₈
Gen Mgr: W R O'Keefe
Asst Mgr: L Hollingshead
Gen Supt: W R O'Keefe
Genl: Edwin Pochlmann
Mine Supt: L Hollingshead
Mine Eng: E Pochlmann
Prod: 40 tons
40-TON MILL, Beaver
Assayer, Crismon-Nichols

NATIONAL LEAD CO INC (Member of Nuclear
Metals Div of NATIONAL LEAD
CO) Contract Oper for Atomic
Energy Commission Uranium
Mill

Monticello
Gen Mgr: O K Coates
Gen Frnt: F A Montella
Sampling Plant Supt:
R H Peterson
Safety Eng: J E Bailey
Tech Supt: E D Dickerman
Ch Eng: H R Saunders
Ind Nat Asst: W F Carman
Comptroller: G L Holt
Purch Agt: S L Mayne
Maint Supt: T O Zuehl
(See Colo, S D, & National Lead
Co, W Y)
NATIONAL TREASURE MINES, INC
% Paul McFarland
2922 S Main St, Salt Lake City
MINE, Tooele Co

NEW PARK MINING CO
901 Walker Bank Bldg
Salt Lake City
Pres & Gen Mgr: W H
Cranmer

VP & Mgr of Oper:
Clark L Wilson
Sec: Robert L Cranmer
Treas: A C Wilson
Purch Agt: Carl D Harper
MAYFLOWER MINE, Keetley
undergr, Au, Cu, Pb, Zn
Gen Supt: Oale A Hansen
Genl: Walter E Bauer
Prod: 120 tons

NEW VERDE MINES CO
Box 904, Blanding
Pres: M D Banghart
VP: R R Fulton
Sec: John Grunow
Treas: G Schmid
STEVENS CANYON MINE,
undergr, U₃O₈
Gen Mgr: J S Wale
Mine Supt: P Loncar

NIELSON, MILTON C
Box 398, Monticello
MINE, U₃O₈

NORTH BINGHAM CONSOL MNG CO
PO Box 36, Pothill Sta
Salt Lake City
VP: Philip S Knight

Sec-Treas & Gen Mgr:
Richard Knight
Idle

NORTH LILY MNG CO
818 Kearns Bldg,
Salt Lake City
MINE, Utah Co

NORTH RANGE MNG CO
1st National Bank Bldg
Negunee, Mich
OXIDE MINE, San Juan Co,
U₃O₈
(See Mich, Minn)

NORTH STANDARD MNG CO
Box 606, Provo
(See Colo)

NORTH WESTERN MNG & EXPL CORP
3 SW 126th St, Seattle 66
Wash
Pres: Albert L Worlman
VP: Lyman Saitty
Sec-Treas: James E Williams
CONSOLIDATED MINE, Emery
County, undergr, V₂O₅,
U₃O₈
(Leased to Abel B Dragon-
Box Holder, Price)
Under devel
(See Mont, Wash)

OBJETO URANIUM CO
114 Atlas Bldg,
Salt Lake City
MINE, U₃O₈

OL JATO URANIUM CO
28 S Broadway, Salt Lake
City
WHIRLWIND MINE, San Juan
Co, U₃O₈
O'KEEFE, WALLACE A
2314 SE 12th St, Portland, Ore
MYSTERY SNIFFER MINE,
Beaver Co, U₃O₈
(See Ore)

OLD TEXAS MNG CO
3301 Worth St, Dallas, Tex
MINE, U₃O₈

OURAY URANIUM CO
Box 992, Moab
**OKIE, SNOWFLAKE & VISION
MINES**, YELLOW CIRCLE &
BURKE LEE MINES, San
Juan Co, U₃O₈

OUT WEST URANIUM & OIL CO
217 Mile High Center, Denver
Colo
MINE, Emery Co, U₃O₈

PAINTED DESERT URANIUM & OIL CO INC
W 1023 First, Spokane, Wash
**BIG CHANCE GROUP &
GUNGA-DREAM GRP MINES**,
Grand Co, U₃O₈
DIKIE GRP MINE, San Juan Co,
U₃O₈
(See Wash)

PHILLIPS PETROLEUM CO, STRATEGIC MINERALS SECTION
Phillips Petroleum Bldg
Salt Lake City
Pres: Clifford N Holmes
Asst Dir: David C Arnold
Mng Eng: Roger Caywood
(See N Mex, Okla)

CHARLES N PICKENS
Manco, Colo
MINE, U₃O₈

PLATEAU CONSOLIDATED MNG CO
410 Road Ave, Grand Junction
MINE, San Juan Co, U₃O₈
(See Colo)

PLATEAU MNG CO
Box 55, Moab
Agent: H W Bailey
YELLOW CIRCLE MINE, San
Juan Co, U₃O₈

PROSPECTORS INC
PO Box 530, Hanksville
MINE, U₃O₈

PLUTUS MNG CO
808 Dooley Bldg
Salt Lake City
Pres: Cecil Fitch
VP & Gen Mgr:
Cecil Fitch, Jr

Sec & Purch Agt: W W Watson
PLUTUS MINE, Baraka
undergr, Ag, Pb, Au
Idle

PULLEN, JAMES A
PO Box 115, Moab
MINE, U₃O₈

QUEEN CORP
6307 Broadway,
San Antonio 8, Texas
VANADUM QUEEN MINE,
San Juan Co, U₃O₈
(See Texas)

RADIUM KING MINES INC
PO Box 3206, Salt Lake City
MINE, U₃O₈

RAMSHORN MINES CO
333 Felt Bldg, Salt Lake City
Pres: W W Murray
Sec & Mgr: L Eagar
Agent: H M Earl
(See Idaho)

RARE METALS CORP OF AMERICA (Affiliate of
EL PASO NATURAL GAS CO)
1st Security Bldg,
Salt Lake City

Pres: C L Perkins (Box 1493,
El Paso, Tex)
VP & Asst Gen Mgr: M H Kline
Sec-Treas: Virgil Rittmann
Asst Sec: Anne Kidd
Ch Eng, Explor Dept:
J R Reynolds
Ch Geol: L A Hansen
Supervisor, Land Dept:
R O Baldwin
Supt, Explor Dept:
E J Carlson
Ch Chem: R Kruant
Purch Agt: Claude J Jenkins
Explor
(See Ariz, Idaho, N Mex)

RICE DEVELOPMENT CO
% Max Osborn, Fruita
Pres: M Osborn
BLUE CAP MINE, San Juan
Co, U₃O₈

RICO ARGENTINE MNG CO
217 Kearns Bldg
Salt Lake City
Pres & Gen Mgr:
Sherman B Hinckley
VP: J C Johnson
Sec: L J Lerwill
Treas: B B Hall
(See Calif)

RIMLEDGE URANIUM & MINING CORP
PO Box 383, Glenwood Springs
Colo
Pres: W E McCormick
VP: F A McCormick
Sec: K Dalton
Treas: J Hooker
LONGSE MINE, San Juan Co,
undergr, U₃O₈
Gen Mgr: W E McCormick
Prod: 120 tons daily
Under devel

RINGTAIL MNG CO
Box 313, Moab
MINE, U₃O₈

RAYMOND C ROBECK
535 Orchard Ave,
Grand Junction, Colo
MINE, U₃O₈

SAN FRANCISCO CHEM CO
Dr F Montpelier, Idaho
ARICKEREE MINE, NE of
Randolph, undergr, phosphate
rock
Gen Supt: Charles C Stephens
(See Idaho, Wyo)

SCOTT, ROBERT B
Box 785, Moab
MINE, U₃O₈

SECRET, ARTHUR O
240 E 3rd St, South, Moab
MINE, U₃O₈

SECURITY URANIUM & OIL, INC
Box 641, Moab
Pres: W U January
Exec VP: E C Funk, Jr
VP: M B Peterson
Sec & Treas: A C January

ROYAL MINE, San Juan Co,
undergr, U₃O₈, V₂O₅, Cu
Prod: 25 tons daily

SENDEX MNG & DEV CORP
PO Box 662, Provo
MINE

SHASTA MINERALS & CHEMICAL CO
613 Dooley Bldg
Salt Lake City
Pres: K L Stoker
VP: Harper Hunsaker
Sec-Treas: Nancy T Hardman
(See Calif)

SHATTUCK DENN COMPANY (wholly owned
subsidiary of SHATTUCK DENN
MNG CORP)
120 Broadway, New York 5
New York
RARDON MINE, Box 246, Moab
undergr, U₃O₈, V₂O₅
Gen Mgr: T W Newell
Gen Supt-Mine Supt:
Frank Garrett
Geol-Mine Eng: Carl Appell
Mine Frnt: Leo Zalk
Office Mgr-Purch Agt:
J D Hill
Prod: 100 tons per day
(See Ariz, Colo, N Y)

SHRIVER, ROBERT S
PO Box 534, Blanding
MINE, U₃O₈

SHUMWAY BROS
Blanding
Partners: Merwin Shumway,
Burdett Shumway, Eugene
Shumway, Olen A Shumway
CLOUDY DAY MINE, KING
EDWARDS MINE, Elk Ridge
dist, San Juan County, U₃O₈

SHUPE, WADE
PO Box 314, Moab
MINE, U₃O₈

SILVER BUCKLE MNG CO
804 Walker Bank Bldg
Salt Lake City
Pres: Dr F B Scott
VP & Gen Mgr: Clark L Wilson
Sec-Treas: Alden Hull
Ch Mgr: Jack D Gay
URANIUM PROP, Big Indian
dist, San Juan County
Explor
(See Idaho, Wash)

SILVER KING EXTENSION MNG CO
163 S Main St, Salt Lake City
MINE, Summit Co, Ag

SILVER KING WESTERN MNG & MLLG CO
% J F Fitzpatrick
1017 Kearns Bldg, Salt Lake
City
MINE, Utah Co, Ag

SILVER LEAF MNG CO
6654 Liggett Drive, Oakland
Calif
MINE, Utah Co, Ag
(See Calif)

SILVER STANDARD MNG CO
703 Utah Savings & Trust
Bldg., Salt Lake City
MINE, Tooele Co, Ag

SIOUX MINES COMPANY
1114 Walker Bank Bldg
Salt Lake City
Pres: H E Redditt
VP: Harriet D Travis
Treas: M D Paine
Auditor: Glen Hardy
SIOUX MINE, Tintic dist, Utah
County, Au, Ag, Cu
(Lessee operation)
Idle

SKYLINE DEVEL CO
Moab
FAULT, BUCKSKIN, GREY
DAWN & YELLOW CIRCLE
GRP MINES, San Juan Co,
U₃O₈

SPIDER URANIUM MNG CO, INC
6 Ilex Bldg, Pocatello, Idaho
MINE, San Juan Co, U₃O₈
(See Idaho)

STANDARD GILSONITE CO
343 S State St, Salt Lake City
MINE, Duchesne Co, Gilsonite

STANDARD URANIUM CORP

364 S 4th E, Moab
Pres: Wm R McCormick
Sec: I Newton Bryan
Treas: Aaron Holman
Purch Agt: Jas B King, Jr
BIG BUCK MINE, Big Indian
Dist, San Juan Co, undergr,
U₃O₈, V₂O₅
Mine Frnt: Robert Hurst
Geol: R B Ward
Mine Supt: David E Axtell
Mine Eng: E R Carahan
Prod: 800 tons
(See Ariz, Colo)

STAR DUST MINES, INC
No 4, 282, E South Temple
Salt Lake City
Pres & Gen Mgr: Fred Cook
VP: Leslie J Batley
Sec-Treas: W M Hance
Purch Agt: M V Cook
STAR DUST MINE, Gold Hill,
undergr, surface, W₂O
(See Nev)

STOCKS, CLAYTON & DON
Moab
MINE, U₃O₈

STOCKS & GRAMLICH, INC
% Paul C Steinka
164 E Center, Moab

FIRE FLY & GREY DAWN MINES, San Juan Co, U₃O₈

SUNBURST, INC
1975 NW Everett St
Portland 8, Oregon
SAN JUAN CLAIMS, Lander
County, undergr, U₃O₈
CANE SPRINGS CANYON MINE
near Moab, San Juan Co,
undergr,
Gen Mgr: J C Young &
Ray Critchlow
Idle
(See Nev, Oregon)

SUNRAY MNG CO
2708 Highway 506
Grand Junction, Colo
CORVUSITE & RED DEVIL NO 1 MINE, Grand & San
Juan Co, U₃O₈
(See Colo)

SUNRISE MNG CO
Box 305, Monticello
SUNRISE MINE, White Canyon
dist, San Juan County, U₃O₈
Prod: 1600 tons per year

SWANSEA CONSOLIDATED MNG CO
Rt 1, Tooele
MINE, Juab Co, undergr,
Cu, Pb, Au, Ag

TEXAS-ZINC MINERALS CORP (Subsidiary of New Jersey
Zinc Co)
1129 Colorado Ave
Grand Junction, Colo
HAPPY JACK MINE, White
Canyon, undergr, U₃O₈
Mine Chf: A G Bernhardt, Jr
1000-TON MILL, Montecito
Nat
Mill Supt: K C Apland
(See Colo)

THREE WAY MNG CO
214 South Tusher, Moab
MINE, U₃O₈

THORNBURG MNG CO
140 W Main St
Grand Junction, Colo
SHINARUMP & CORRAL MINE
12 1/2 mi NW of Moab, undergr
U₃O₈
Mine Supt: Edward G Johnson
Prod: 25 tons
(See Colo)

TIMBERMAN, A E
PO Box 332, Green River
MINE, U₃O₈

TINTIC CENTRAL MNG CO
PO Box 57, Provo

Pres: Philip S Knight
MINES, undergr, Pb, Ag, Au
Idle

TINTIC LEAD CO
38 Exchange Place
Salt Lake City
Pres: Robert A Hunt
VP: D M Draper, Jr
Sec-Treas: D H Bullough
MINE, Milford, open pit, Cu
(Leased)

TINTIC STANDARD MNG CO

114 Walker Bank Bldg
Salt Lake City
Pres: H E Raddatz
VP: W W Romney
Treas & Gen Mgr: M D Paine
Sec: Glen Hardy
TINTIC STANDARD MINE,
Dividend, undergr, Au, Ag,
Cu, Pb, CaF₂
Under devel

TINTIC URANIUM CO

114 Walker Bank Bldg
Salt Lake City
Pres: H E Raddatz
VP: L L Travis
Sec: Glen Hardy
Treas: M D Paine
PATS PROPERTY, P O Box
633, Moab, UG₀
Mine Supt: Ralph E Hawks
Prod: 7 tons per day

TRI CITIES MNG CO

P O Box 121, Green River
MINE, UG₀

TWO STATES URANIUM CO

Box 27, Bountiful
Pres: Dr D K Christensen
VP: Dr W C Lee
Sec: Frank C Neilson
Treas: R N Schluter
(See Nevada, Wyo & Peterson,
MF & Lorenzo, in Nevada)

U-NEVA URANIUM CORP

Suite #101, 146 S Main St
Salt Lake City
MINE, Emery Co, UG₀

UMONT MNG CO

912 Kearns Bldg, Salt Lake
City 1, Utah
Pres: L P Evans, Jr
VP: D G Foreman
Sec-Treas: VP
R H Wadhams

VP-Gen Mgr:

Dooley P Wheeler, Jr

UNION CARBIDE

NUCLEAR CO, A DIV OF

UNION CARBIDE CORP

P O Box 1040, Grand Junction,
Colorado
Gen Mgr: J L Lake
Mgr: Mines: J F Emerson
Mgr: Plants: A C Soda
MINE, Green River, UG₀
MILL, Green River
Mill Supt: F H Harrison, Jr
(See Calif, Colo, Nev, N Y,
Wyo)

UNITED MERCURY & OIL CORP

197 E Glenasmith Blvd
Glendale 8, Calif
Pres: W Andrews
VP: E Davis
Sec: G Mahony
Treas: H Swanson
MINE, near Milford, open pit, S
Gen Mgr: G Mahony
Asst Gen Mgr: G Hogan
Mine Supt: Wm Rowell
GRINDING MILL, near Milford
Also Cinnabar furnace
(See Sulphur Mng & Supply Co,
Calif)

UNITED PARK CITY MINES CO

826 Kearns Bldg
Salt Lake City
Pres: John M Wallace
VP & Gen Mgr: S K Droubay
Sec-Treas: E L Osika
Purch Agt: T K Davis
UNITED PARK CITY MINES,
Heber and Park City, undergr,
Pb, Zn, Ag
Gen Supt: Walter J Desell
Ch Geol & Engr: M F Barnes
Mech Eng: P O Reynolds
Elec Eng: Frank M Stone
Met: Jack Wilson
Asst Mine Supt: Arthur Gray
Mine Frm: Marcus Jolley
Mine Eng: Harry Doppler
Prod: 350 tons daily

UNITED STATES GYPSUM CO

300 W Adams St
Chicago 6, Ill
MINE, Sigurd, open pit,
gypsum
Works Mgr: J P Seavers
(See Calif, Colo, Conn, Ill,
Ind, Iowa, Mass, Ohio, S Dak,
Tex, Va)

U S LITHIUM CORP

1205 Walker Bank Bldg
Salt Lake City
Pres & Gen Mgr: Paul T Walton
VP & Sec: N G Morgan, Jr
(See Colo)

UNITED STATES SMELTING, REFINING & MINING CO

WESTERN OPERATIONS

P O Box 1800, Newhouse Bldg
Salt Lake City 10
VP & Gen Mgr, West Oper:
Oscar A Glaeser
Ind Devel Dir: J M Ehrhorn
Ch Mech Engr, West Oper:
H Ashurhoff

UTAH OPERATION

U S & LARK MINE, Bingham
Dist, Pb, Zn, Cu
Mgr: Benton Boyd
Mast Mech: Roy D Nealley
Ch Clk: Jess A Coffey
Supt-U S Sect: J W Holmes
Mine Frm, U S Sect:

Ned Fresh

Supt, Lark Sect: H H Wells

Mine Frm, Lark Sect: A L Whitmore

MIDVALE FLOT MILL

Mgr: H L Johnson
Ore Buyer: Blaine Watts
Supt: A A Nelson
Dir, Research Lab:
Loren A Creglow
Ch Chem: F J Marshall
(See Alaska, Ariz, Mass, N Mex)

U S STEEL CORP

COLUMBIA-GENEVA DIV

126 Montgomery Street
San Francisco, California
VP-Oper: J D McCall
Mgr, Utah oper: L F Black
Gen Supt: H E Terry
BLAST FURNACE, Geneva,
near Provo
(See Alaska, Ala, Calif, Minn,
Pa, Tenn, Wyo)

URANIUM INDUSTRIES INC

523 Colorado Bldg
Denver, Colorado
VANADUM KING MINES NO
1, 3, 5, Temple Mt Dist,
Emery County, UG₀
(See Colo)

URANIUM REDUCTION CO

557 1st Security Bldg
Salt Lake City 11
Chmn: E H Snyder
Pres: Mitchell Melick
Exec VP: R A Young
VP: Charles A Steen
Sec: J S Natus

Cont & Treas: John W Lasse, Jr

Purch Agt: Rex Jones

MILL, Moab, Acid & Alkaline

Leach, RIP

Gen Mgr: R F Hollie

Plant Supt: L A Painter

Asst Plant Supt: R N Unger

Ch Met: T Izzo

Plant Met: Buford Winn

Ch Chem: John Goff

URANIUM VENTURES, INC

1206 Depot Quarry Bank

Bldg, Jackson, Miss

(See Miss)

UTAH ALLOY ORES, INC

Room 302, 101 N High St

Columbus, Ohio

Sec: Simon Nash

YELLOW CAT MINE, Yellow

Cat Dist, Grand County, UG₀

UTAH CONSTRUCTION & MNG CO

100 Bush St, San Francisco,

California

HON SPRINGS MINE, 11 mi W

of Cedar City, open pit, Pb

Mgr: E C DeMoss

Asst Mgr: R J Long

Office Mgr: E J Robison

Purch Agt: Mark Webster

Geol: E F Hansen

Chem: Albert Adams

Mine Supt: Y F Jones

Mine Engr: Donald Bellum

Prod: 5000 tons per day

CRUSHING & SCREENING

PLANT, at Mine

(See Calif, Wyo)

UTEX EXPLOR CO

P O Box 487, Moab

Pres: Charles A Steen

VP: Wm R McCormick

Sec: Mitchell Melick

Treas: Maxine Steen Boyd

Exec Asst: Mary Hope

Westbrook

Purch Agt: Margie Shafer

MI VIDA MINE, 41 mi SE of

Moab, San Juan Co, undergr,

UG₀

Mine Supt: Gen Supt:

Virgil Blyce

Asst Supt: Ted Barrett

VALLEY MNG INC

Box 248, Moab

BORSESHORE, POSEY & RED

CANYON, San Juan Co, UG₀

YELLOW BIRD MINE, Grand

Co, UG₀

VALLEY-DEAN CORP

Box 27, Bountiful

Pres: Merlin Neish

VP: Arthur Seifert

Sec: Frank C Neilson

Treas: R N Schluter

(See Wyo)

VANADIUM CORP OF AMERICA

420 Lexington Ave, NY 17,

N Y

Controller: J J Spellen

HENRY MTN GROUP, Garfield

Co, UG₀

PROSPERITY MINE, Plute

Co, UG₀

HYDE & DUCKETT GRP,

CARBUTT GRP & URACOP

MINE, San Juan Co, UG₀

VITRO CEM CO

(A DIV OF VITRO CORP OF AMERICA)

600 W 3300 St St

Salt Lake City

Pres: W B Hall

VP: R C Cole

Sec: W H Denne

Treas: R T Ruder

Purch Agt: C A Theobald

650-TON HYDROMETALLUR-

GICAL PLANT, Salt Lake City

Plant Met: N N Schiff

Oper Supt: M T Ellis

Main Engr: T G Ruhavina

Prod Mgr: J D Moore

Ore Buyer: R B Coleman

Ch Chem: G W Hansen

(See Vitro Minerals Corp, Wyo)

WASATCH MINES CO

561 E 3900 South, Murray

Pres: T Jacobsen

HOWLAND MINE, Salt Lake

Co, Pb, Zn

WELCH MNG CO, INC

9428 Culbreth Ave

Lakewood, Calif

Pres: Lynn B Welch

VP: John R Mendez

Treas: Robt P Coykendall

MINE, in Utah, UG₀

WEST PARK MINING CO

Box 480, Provo

Pres: J H Peterson

VP: Arvil H Scott

Sec-Treas & Purch Agt:

Dran W Payne

WEST PARK MINE, 2 mi S of

Brighton & 8 mi NW of Midway,

undergr, Cu, Au, Ag

Gen Mgr: Arvil H Scott

Geol: E A Hewitt

Prod: 5 tons

WEST TOLEDO MINES

39 Exchange Place

Salt Lake City

Pres: Sid Spencer

Sec-Treas: David H Bullough

MINES, Alta, Little

Cottonwood Dist, undergr, Pb

Ag

WESTERN GOLD & URANIUM INC

Box 95, Grand Canyon, Ariz

SILVER REEF MINE, Leeds,

undergr, Ag, Cu, UG₀

Idia

300-TON FLOT MILL, Silver

Reef

(See Ariz, Colo)

WESTERN MINERALS INC

Box 543, Moab

HERCULES & RED O MINES,

San Juan Co, UG₀

(See Wyo)

WESTERN MINERALS

DEVEL CO, INC

UTAH CORPORATION

Vernal

Mgr: J B Freestons

(See Wyo)

WHELCHER MINES CO

1010 Arthur St, Caldwell

Idaho

Pres: William E Whelchel

VP: Ralph A Whelchel

Sec-Treas:

Theresa M Whelchel

MEGATON & PLUTOMIC

GROUP, UG₀, V₂O₅

Under devel

(See Nev, Idaho)

WHITE CANYON MNG CO

1125 Colorado Ave

Grand Junction, Colo

HIDEOUT WHITE CANYON NO

1, Fry Canyon, San Juan County,

UG₀, undergr

Mine Supt: Ludwig W Koch

Mine Frm: Leamon May

Prod: 300 tons

(See Colo)

WILKERSON, L H

Box 5, Thompson

Own: L H Wilkeron

RINGTAIL MINE, UTAH

STATE LSE & 3971 MINES,

Yellow Cat Dist, Grand Co.,

UG₀

WINBOURN, JIM L

P O Box 3-4, Moab

MINE, UG₀

WOODMONT, INC

820 S Ninth St, P O Box 1530

Grand Junction, Colo

RATTLENAKE MINE, Moab

open pit, UG₀, V₂O₅

Mine Supt: John Roscoe

Prod: 200 tons

WORTLEY, G WM

1781 Treas St, Salt Lake City

APEX STANDARD, Juab Co, Au

MINE, UG₀

WRIGHT, BURKE

P O Box 854, Monticello

MINE, UG₀

WRIGHT, CHESTER

Nack, Colo

MINE, UG₀

WRIGHT, CLYDE J

P O Box 388, Paradox, Colo

MINE, UG₀

F M WRIGHT MNG CO

Moab

HERCULES GRP MINE, San

Juan Co, UG₀

WRIGHT, NEITH

La Salle Junction

MINE, UG₀

YANKEE CONSOLIDATED MNG CO

5 International Smelt

Philadelphia 44, Pa
SUNBRIGHT DIVISION,
 Duffield, c/o W Edwin Dill, Jr
 MINE, Sunbright, undergr
 limestone
 Gen Mgr: A McDonald
 Asst Gen Mgr: W Hudspeth
 Mine Supt: T Evans
 Mine Frm: J Hughes
 MILL, at mine
CHEMICAL PLANT, at mine
 (See N H, N C, Pa, Tenn)
**INTERNAT'L MINERALS
 & CHEMICAL CORP**
 Piney River
APLITE MINE
 Supt: Claude Ellis
 (See Ariz, Fla, Ill, Maine,
 Miss, N Mex, N C, S D, Tenn
 Wyo)

KYANITE MNG CORP
 Dillwyn
 Pres-Treas: Gene Dixon
 VP: G A Dixon
 Sec: Terrell Harvey
 Purch Agt-Asst to Pres:
 Hugh B Andrews, Jr
BAKER MOUNTAIN MINE,
 Cullen, open pit, Kyanite,
 Mullite
WILLIS MOUNTAIN MINE,
 Dillwyn, open pit, Kyanite
 Gen Mgr: Gene Dixon
 Asst Gen Mgr: Hugh B Andrews,
 Jr
FLOT MILL, at mine sites
**PROCESSING & STORAGE
 PLANT**, Pamphila
 Supt: C B Kay

**METAL & THERMIT
 CORP**
 100 Park Ave, New York, NY
 Pres: H E Martin
MANOVER PLANT, Rt 3,
 Beaverdam, open pit, Rutile,
 Ilmenite
 Gen Mgr: K E Doud
 Gen Supt: C M Goin
 Prod: 800 tons per day
 (See N Y)

**MINERALS & CHEMICAL
 CORP OF AMER**
 Menlo Park, N J
 MINE, Strasburg, open pit,
 Limestone
 (See Chemstone Corp, Ohio)

NATIONAL GYPSUM CO
 Kimballton
 MINE, undergr, limestone
 Mine Eng: C S Liebowski
 Plant Mgr: Monroe Rule
 Mine Supt: R G McDonald
 Prod Super: James M Huffman
 Prod: 3000 tons
1500-TON MILL
 Supt: George Miles
 (See Ind, Iowa, Kans, N Y,
 Tex)

NEW JERSEY ZINC CO
 Austintville
BERTHA MINERAL DIV MINE,
 Zn, Pb
2,000-TON FLOT MILL
 Supt: C O Morgenstern
 (See Colo, Ill, N J, N Mex, N Y,
 Pa, Tenn, Wis)

REYNOLDS MNG CORP
 Reynolds Metal Bldg
 Richmond 18
 Pres: Walter L Rice
 VP: R H Zieglin
 Geol: John D Moore
 Purch Agt: J W Glover
 (See Ark, Texas)

**RIVERTON LIME &
 STONE CO**
 Riverton
 Pres: J C Holm
**DOMINION MINERALS DIV
 MINE**, Piney River, open pit,
 apatite rock
 Plant Mgr: W K Rodenbaugh
 MILL, Piney River

TRI-STATE ZINC INC
 123 William St
 New York 38, New York
BOWERS-CAMPBELL MINE,
 Timberville, undergr, Zn
 Gen Mgr: V C Allen
 Gen Supt: L G Hayes
 Prod: 726 tons daily
725-TON FLOT MILL
 Timberville
 (See Ill, N Y)

U S GYPSUM CO
 Plasterco
 Works Mgr: H D Decker
NUMBER SIX MINE, at
 Plasterco, undergr, gypsum

Mine Supt: E M des Rochers
 Prod: 450 tons
 (See Calif, Colo, Conn, Ill,
 Ind, Iowa, Mass, Ohio, SD,
 Tex, Utah)
**VIRGINIA-CAROLINA
 CHEM CO**
 401 E Main St
 Richmond 8
 Pres: Justin Potter
 VP: C E Heitzler
 Sec: R C Long
 Treas: A M Schuster
 Purch Agt: Douglas W Laird
 (See Fla, Tenn)

WASHINGTON

**AMERICAN SILVER MNG
 CO**
 123 N 4th Ave, Spokane
 Pres & VP: J M Henneck
 Sec & Treas: L B Conrad
 (See Idaho)

**AGUILA LEAD SILVER
 MINE**
 Rice
 Part: John Marty and Marvin
 Medlock
MINE, Stevens Co, Pb, Ag, Cu
 Under devel

**ALASKA-CANADIAN
 MINES, INC**
 PO Box 333, Colville
 Lessor: E M Welbert
MINE, O'Toole Mtn Area,
 Stevens Co, rare earths
 Under devel

AMCO MNG CO
 17401 10th N E, Seattle
 Pres: Fred Lawless
WAYSIDE MINE, Granite Falls
 Area, Snohomish Co, Pb, Cu
 Ag, Zn
 Under devel

**AMERICAN EAGLE MNG
 CO**
 9015 Empire, Millwood
 Pres: Ronald E Madden
 VP: Gilbert McGlocklin
 Sec-Treas: Ward Shafer
MINE, Rice area, Stevens Co,
 Pb, Ag, Cu, Au
 Under devel

**AMERICAN SMLTG &
 REF CO**
 Box 59, Colville
NORTHPORT UNIT, surface,
 Zn, Pb
 Mgr: J C Kieffer
 Frmt: Frank Pappasich
 Acct: Fred Harding
 Prod: 1,990 tons
1,000-TON FLOT MILL
 Plant Idle

TACOMA SMELTER, Box 1605
 Tacoma, Copper smelter,
 Electrolytic refinery, arsenic
 refinery & acid plant
 Mgr: R E Shinkosky
 Asst Mgr: M C Teats
 Oper Supt: M L Pines
 Purch Agt: H L Kunderd
 (See Ariz, Calif, Colo, Idaho,
 Ill, Md, Mont, Neb, N J, N Mex
 N Y, Tex, Utah & Federal
 Mng & Smelting Co, Mo)

**AMERICAN ZINC, LEAD
 & SMELTING CO**
 927 Old Nat'l Bank Bldg
 Spokane
 Mine Mgr: R E Cathoun
 Purch Agt: R F Sharp
GRANDVIEW MINE, Metaline
 Falls, undergr, Zn, Pb
 Res Mgr: John W Currie
 Asst Res Mgr: W M Cathoun
 Mine Supt: Otis M Hagberg
 Assay: F H Shellenberger
 Mine Eng: R J Lampson
 Prod: 450 tons
750-TON FLOT MILL
 Mill Supt: D A Underwood
 (See Ariz, Ill, Mo, N Mex,
 Ohio, Okla, Tenn, Tex, Utah,
 Wisc)

B B & M MNG CO
 2433 W LaCroce, Spokane 13
 Pres: Otto L Bagdon
 VP: Carl W Martinson
 Sec-Treas: Kenneth R Bagdon
 (See Idaho)

BASIC MINERALS LTD
 Aladdin Rd, Colville
**LAST CHANCE CONSOL MINE
 & GREAT WESTERN MINES**,
 North Port, undergr,
 Stevens Co, Pb, Zn
 Mgr: Irvin Bennett
 Idle
100-TON FLOT MILL, 6 mi
 from North Port
 Mill Supt: Irvin Bennett
 Idle

BEAR CREEK MNG CO
 W 508 Cataldo Ave, Spokane
 Mgr: S E Jerome
MINE, Miner's Ridge area,
 Snohomish Co, Cu, Au, Mo,
 WO₃
 Under devel
MINE, Mt Buckindy area,
 Skagit Co, Cu, Au, Mo, WO₃
 Under devel
 (See N Y, Utah & Kennecott
 Copper Corp, N Y)

**BEAR CREEK URANIUM
 EXPL**
 Rhame, N Dak
MINE, Mt Spokane area, U₃O₈
 Under devel
BOAZ MNG CO
 708 Joshua Green Bldg
 Seattle 1
 Supt: Ivan R Manfield
BUFFALO MINE, Grant County
 Granite dist, Ore
 Au, Ag, Cu, Pb, undergr
 Mgr: J P Jackson
FLOT MILL
 (See Oregon)

BONNIE MINE, INC
 Box 307, Colville
 Pres: Leonard Salter
PHIL SHERIDAN MINE, E
 Fork Toroda Cr area,
 Okanogan Co, Ag, Cu, Pb, Zn
 Under devel

BUNKER HILL CO, THE
 The Bunker Hill Bldg
 680 Market St, San Francisco
 4, California
BONANZA MINE, Colville, Pb
 Ag
 Under devel

**FABRICATION PLANT &
 SECONDARY LEAD SMELTER**,
 2700 18th Ave, SW, Seattle 4,
 Wash
 Prod Mgr: Alvin Kroll
 VP, Sales & Fabrication:
 Roger H Cutting
 (See Calif, Idaho)

**CHIEF JO TUNGSTEN
 INC**
 Box 689, Okanogan
 Mgr: Fred Timm
TIMM BROS PROPERTY MINE,
 Goose Lake area, Okanogan
 Co, WO₃
 Under devel
30-TON GRAV MILL
 Under constr

**CLAYLOON URAN CO,
 INC**
 318 Peyton Bldg, Spokane 1
 Pres: Byrd T Goodwin, Jr
LEAD TRUST MINE,
 Gladstone Mtn, Stevens Co,
 Pb
 Under devel
**CLEAR WATER MINES,
 INC**
 401 Empire State Bldg
 Spokane 1
 Pres: H G Loop
 VP: John Neely
 Sec-Treas: E I Fisher
 Purch Agt: John Healy
 (See Idaho)

**CLE ELUM RIVER MNG
 CO**
 310 Blaine St, Seattle 9
 Pres: Phil Denney
**CAMP CREEK SILVER,
 SILVER CREEK GOLD &
 MT HAWKINS COPPER
 PROPERTIES**, Camp Cr area,
 Kittitas Co, Ag, Au, Pb, Zn,
 Cu
 Under devel
MILL, near Camp Cr
 Under constr

**CONJECTURE MINES,
 INC**
 421-427 W 3rd Ave, Spokane
 Pres & Purch Agt: Donald E
 Major
 VP: Herbert L Sanderson
 Sec-Treas: Lyle H Funnell
 (See Ida)

**CONSOL MINES &
 SMELTING CO., LTD**
 Star Rt, Wilbur
 Pres: Hugh Brown
 VP: Jack Blaine
 Purch Agt: Douglas Brown
 Sec: E H Edges
 Treas: D N Gellatly
THREE PROPERTIES at
 Keller, Ferry County, undergr
 & open pit, Cu, Mn, Pb, Zn
 Mn, U₃O₈
 Under devel

DAWN MNG CO
 Ford
 Pres: G S Hinesdale
MIDNITE MINE, Stevens Co,
 U₃O₈, open pit
 Mgr: J W Pike
 Geol: James W Wilson
 Mine Supt: Pat Lomcar
 Mine Eng: Keith Payne
 Prod: 440 tons per day
440 TON MILL, Ford
 Mill Supt: Paul E Stucker
 Mill Frmt: W H Darlingston
 Assayer: Lloyd Vorkman
 (See N Y)

**DAYBREAK URANIUM,
 INC**
 12707 Valley way,
 Opportunity 87
 Pres: James W Fox
 VP: A Alvensleben
 Sec-Treas: Kae H Sowers
DAYBREAK MINE, Spokane Co,
 open pit, autinite, uraninite,
 coffinite
 Mine Supt: E A Collins
 Under devel

**DEEP LAKE MNG & MLG
 CO**
 Box 684, North Bonneville
 Pres: Ray Ziegler
**JACKSON, LAKEVIEW, LEAD
 KING, LUCILLE MINES**,
 Leadpoint area, Stevens Co,
 Zn, Pb, Ag
 Under devel
DEEP LAKE MINE, Deep
 Lake area, Stevens Co, Zn,
 Pb, Ag
 Under devel

DELMAR MNG & MLG CO
 W 5018 Lumsin
 Spokane 19
 Pres: Norman E Mills
 VP: Adolph Okerl
 Sec: Harry O Klaus
 (See Idaho)

**DEVIL'S CANYON MNG
 CO, INC**
 801 Central Bldg, Seattle 4
 Pres & Gen Mgr: Vernon M
 Osterberg
 VP: W D Gotham
 Sec: Ragni B Osterberg
 Treas: Dr G M Osterberg
DEVIL'S CANYON MINE, Buena
 Vista Mng dist, King County,
 undergr & open pit, Cu
 Mo, WO₃, Ag
 Under devel

DIAMOND PROPERTY
 Rte 1, Sedro Woolley
 Mgr: Wm Soren
MINE, Cascade Pass area,
 Skagit Co, Ag, Pb, Zn
 Under devel

**EVERGREEN URANIUM
 EXPLORATION CO**
 Route 1, Box 69, Rockford
 Pres: J V Dimitroff
 Sec & Treas: J V Dimitroff
MOURNING LEASE MINE, Mt
 Spokane dist, undergr & open
 pit, U₃O₈
 Gen Mgr: J V Dimitroff
 Geol: D M Berry
 Prod: 70 tons daily

FLAG HILL MINES CORP
 Rte 11, Box 334, Olympia
 Pres: Percy Bergt
 Sec: Mas Euid K Neilan
SPokane PROPERTY,
 Wannacut Lake area,
 Okanogan Co, Au, Ag
 Under devel

FORD ROCK MNG CO
 Box 383, Post Falls, Idaho
MINE, Ferry County, undergr,
 U₃O₈

FOURTH OF JULY MINE
 9 Pogue Rd, Omak
 Mgr: Cecil B Murray
MINE, Coconino area,
 Okanogan Co, Ag

**GERMANIA CONSOL
 MINES, INC**
 401 Empire State Bldg
 Spokane 1
 Pres & Gen Mgr: Henry J Franz
 VP: H G Loop
 Sec-Treas: E I Fisher
GERMANIA CONSOL MINE,
 Hunters, undergr, WO₃,
 U₃O₈
40-TON GRAV FLOT MILL,
 Hunters
 Idle

**GIBBONSVILLE PREMIER
 GOLD MINES, LTD, INC**
 620 Farnwell Bldg, Seattle
 Pres: H M Vasey
 Mgr: B C Burnaby
 Sec: S Edelstein
 (See Idaho)

GLACIER MNG CO
 4038 Evanston Ave, Seattle
 Pres: R B LaFlamboy
 Mgr: J R Atkeson
GLACIER MINE, Glacier area,
 Whitcomb Co, Cu, Ag, Au
 Under devel

**GOAT CREEK MNG &
 DEV CO**
 17842 Fremont, Seattle 33
 Mgr: R G Stewart

GOLD EAGLE MINES INC
 1449 4th St, Chehalis
 Pres: Orville W Roundtree
 VP: Stanley Reszkoewsky
 Sec: Bernice Dutcher
 (See Nev)

GOLD BOND MINING CO
 300 Columbus Bldg, Spokane 4
 Pres: Frank Lilly
MINE, Chelan County, As, Ni
 Under devel

**GOLDFIELD CONSOL
 MINES CO**
 81 Montgomery St,
 San Francisco, California or
 Aladdin Rte, Colville
 Res Mgr: T Higginbotham
ANDERSON MINE, Leadpoint
 dist, Zn, Pb
 Under devel

GRANDVIEW MINES
 310-311 Radio Central Bldg
 Spokane 4
 Pres: Karl W Jaeger
 VP: Paul Hoetzel
 Sec: E K Harless
GRANDVIEW MINE, Metaline
 Zn, Pb
 Prod: 800 tons
JUST TIME CLAIMS, Lead-
 point area, Stevens Co, Pb, Zn
 Under devel
 (Operated by American Zinc,
 Lead & Smelting)

**GREEN NUGGET MNG
 CO**
 Iona
 Mgr: E Sheffler
**WAHOO & GREEN NUGGET
 MINES**, Lamb Cr area, Pend
 Oreille Co, U₃O₈
 Under devel

HAMMOND & JOHNSON
 Part: A W Hammond, South
 Bend
 L C Johnson, Box 147,
 Groveland

MINE, Shakers Bend area,
 Okanogan Co, Fe
 Under devel

HERA EXPLOR CO
 Box 8, Ranton
 Pres & Gen Mgr: W N Piliatos
 VP: Dr H J Collins
 Sec: George Ames
 Met-Geol: J J Sherwood
 (See Mont)

HILL, C C
 W 815 Mountain View Ave
 Spokane 53
KULZER MINE, Valley area,
 Stevens Co, Fe
INDUSTRIAL MNG INC
 Hamilton
 Pres: Fred P Nielson
MINE, Twin Sisters area
 Skagit Co, Cr

IOWA MINE
 Lessee: Robt T Curtiss
 Rte 1, Box 156, Monroe
MINT CLAIM, Sultan Basin
 Dist, Snohomish Co, Cu, Ag,
 Au, Mo
 Under devel
 (Leased from Sultan Basin Mng
 Co)

KNOB HILL MINES, INC

208 Suncrone St
San Francisco, California
Pres: H H Kuehler, Jr
VP & Gen Supt: A R Patterson
Sect: D D Farley

Treas: L E Heller
KNOB HILL MINE, Republic
dist, undergr, Au, Ag

Gen Mgr: H R Patterson
Mine Supt: J E Davis
Mine Frms: F E Jordan

Mine Eng: L R B Atwater, Jr
GOLD DOLLAR PROP,
Republic Dist.

(Leased from Day Mines, Inc)

400-TON FLOT MILL

Cyanidation of tailings

Mill Supt: Louis Lembeck

Mill Frms: R A Kella

Mill Assays: A D Brenner

KROMONA CONSOL MINES INC

121 Lloyd Bldg, 8th & Stewart
Seattle 1

Pres: Joe F Krom

VP: H F Madison

Sec-Treas: Louis Williams

KROMONA MINE, Sultan Dist,
Ca, Mo, Wg, Ag, Au

Gen Mgr: Joe F Krom

Cons: Arthur Colyar

Mine Frms: Earl Bellamy

120-TON FLOT MILL, at mine

Mill Supt: W H Marquette

Under devel

LA SOTA-JONES LEAD & ZINC CO

Medicine Falls

Pres: F P LaSota

VP: E F Jones

Sec-Treas: Dolly Ricker

LA SOTA-JONES MINES, State
Ca Dist, surface, Zn, Pb

Under devel

LITTLE KING TUNGSTEN MINE

Box 384, Deer Park

LITTLE KING TUNGSTEN MINE

Blue Grounds, Mo, Wg

Mgr: W H West

Prod: 12-15 tons

25-TON GRAY MILL, at mine

LOTZE, A G

Allendale Res, Colville

GLADSTONE MINE, Northport
dist, Stevens Co, Pb, Zn

(Leased from R H Graham,
202 Radio Central Bldg,
Spokane 4)

LOVITT MNG CO, INC

Box 1868, Wenatchee

Pres: E N Lovitt

VP: Vere McDowell

Purch Agt: Leo McRae

GOLD KING MINE, 3 mi S W

Wenatchee, undergr &
surface, Au, Ag, silica

Mine Supt: Oscar Thompson

Prod: 250 tons

MAGNETIC MINES, INC

Rt 6, Box 4254 Castlerock

Ave, Wenatchee

Pres: Marion Dunganer

VP: O Gensinger

Sec-Treas: R L Evans

KULZER MINE, Stevens Co, Pb

MAGNETIC MINE, Northport
Okanogan Co, open pit, Pb

Under devel

(Mine surveyed & tested by
Mitsui & Co, Tokyo, Japan)

MARCEAR, TED & AL (LESSEES)

Chelan

RED CROSS & LEROY CLMS,
Liberty Dist, Kittitas Co, Au

Under devel

MINER'S MNG, INC

Rt 3, Civ Elum

Pres: Ed Miner

VARIOUS PROP, Liberty area

Kittitas Co, Au

Under devel

MITSUBI BUSSON KAISHA LTD MINING DIVN

525 Exchange Bldg, 821

Second Ave, Seattle

BUCKHORN IRON MINE,
Buckhorn Mtn area, Okanogan
Co, Pb

Mgr: Saburo Nishimura

Under devel

MODERN MINES DEVEL

307 Larson Andrews Bldg

Yakima

HIGH NOON & JET 8 MINES,
Big Horn Co, Wyo

(See Wyo)

MONTANA IRON MNG CO

5716 Croase St, Seattle 18

Free & Purch Agt: D F

Whitaker

Dir: Lemuel G Wingard,
Morton H Whitaker

VP: W E Hall

(See Mont)

MT BAKER MNG & MFG CO

2215 Union St, Bellingham

Pres: H V Carson

SEC GRATE MINE, Mt
Baker, Whatcom Co, Zn, Pb

Au, Ag

Under devel

MUDHOLE EXPLOR, INC

712 Hutton Bldg, Spokane 4

Pres & Gen Mgr: Adolf Nissen

VP: Ralph E Umbreit

Sec-Treas: Duane H Watters

EXPLOR, Mt Spokane area,
surface, Ugo

Under devel

NEVADA RAWHIDE MNG CO

114 College Ave, Cheney,

Pres: Clarence Davis

VP: Cline E Tedrow

Sec: Arthur Colyar

Treas: Arthur Colyar

PYRMID MINE, Pb, Ag, Au

Gen Mgr: H M Erb

Geol: Cline E Tedrow

Ele. Eng: Lyman Johnson

Under devel

TENDERFOOT GRP, Stevens
Co, Gillette Mtn Area, Pb, Ag

Under devel

25-TON FLOT MILL, Holy
Cross mag dist, Nev

Mill Supt: Mill Frms: H M Erb

Assays: H M Stoeckl Co

(See Nev)

NEW YORK-ALASKA GOLD DREDGING CORP

2501 Smith Tower, Seattle

Wash

Pres & Man Dir: J A Crowley

VP: G C Kogay

Sec: Lewis G Robbins

Treas: Pannie Barker

Purch Agt: L E Robbins

(See Alaska)

NORTHWEST MAGNESITE CO

Chewelah

Pres: E A Garber

VP: C A Sargent

Sec-Treas: E R Wilker

Gen Mgr: H A Ziebell

Plant Supt: Barney Endrice

Plant Eng: Clyde Holen

Purch Agt: L A Knight

RED MARBLE MINE, 20 mi
SE of Chewelah, surface,
magnetite

Mine Supt: Robert L Fish

Mine Frms: Lloyd King

John Estes

Mine Eng: J Brannan

Prod: 2,000 tons

3,000-TON FLOT MILL &
HEAVY MEDIA

Mill Supt: T W Morton

NORTHWEST MINERALS INC

PO Box 1369, Spokane 1

Pres: Forrest M Garrett

VP: H E Beely

Sec-Treas: Don A Gillis

Purch Agt: Don A Gillis

WYNOOP LEASE, Wellpoint,
undergr UO

Cora Eng: Sam Richardson

Fis Geol: David M Berry

Explor

(See Idaho)

NORTHWESTERN MNG CO

PO Box 806, Des Moines

(See California)

NORTH WESTERN MNG & EXPL CORP

534 W 136th St, Seattle 68

Pres: Albert L Workman

VP: Lyman Baiter

Sec-Treas: James E Williams

(See Utah, Mont)

OLYMPIC MANGANESE MNG CO

1123 10th Ave North

Seattle 1

Pres & Gen Mgr: H J Logus

Sec-Treas: M A Logus

TUBAL-CAIN MINE, 15 mi W
of Quilicura, undergr, Mn
Idle

P & N EXPLOR & MNG CORP

Box 132, Wenatchee

Pres: Geo W Heller

BLACKBIRD CLMS, Concomity
Dist, Okanogan Co, Pb, Cu

Under devel

PAYMASTER MINES, INC

Box 44, Pateros

Pres & Mgr: Paul Rogstad

VP: H Rolon

Sec-Treas: H Pickering

HOLDEN-CAMPBELL GRP,
Squaw Cr Dist, near Pateros
Co, Wg, Au, Ag

Under devel

55-TON GRAY MILL

Under constr

PEND OREILLE MINES & METALS CO

923 Old Nat'l Bank Bldg

Spokane 1

Pres: Jens Jensen

VP: W W Witherspoon

Sec & Treas: A C Wimberly

Consultant: W L Zeigler

PEND OREILLE MINES, 3 mi
N of Metaline Falls, undergr,
Zn, Pb, Ag

Purch Agt: R G Walker

Res Mgr: L M Kinney

Supt: L G Billings

Frms: Craig Cody

Mine Eng: Paul McIlroy

Ch Eng & Geol: Roy A Anderson

Prod: 2,000 tons

2,400-TON FLOT MILL,
Metaline Falls

Mill Supt: J C Crampson

Assayer: H W Townsend

Ch Elec: R A Sherman

RILEY LEASE

Leased: John Macrao, Sr,

John Macrao, Jr, and

Lawrence Stevens

Rt 1, Box 292, Elma

SHI BEACH PLACER,
Neah Bay area, Clallam Co,
Au

(Leased from Jerry B Riley,
Rt 1, Box 290, Elma)

ROCKCREEK SILVER-LEAD CO

2006 of Riverside Ave,
Spokane

Pres: F Messer

Sec & Mgr: J H Christman

(See Idaho)

ROCKY CREEK MINE

Northport

Part: Geo. Jensen & Joseph R

McNamee

MINE, Tiger area, Pend
Oreille Co, Pb, Ag, Au

Under devel

RUBY VALLEY DEVEL CO, INC

6114 S Montgomery St.,
Tacoma 9

Pres: H K Albrecht

VP: Raymond Bauman

Sec: William Sorenson

Treas: H B Gibbs

(See Mont)

SAGINAW GOLD & COPPER MINES, INC

505 Gladstone St

Bellingham

Pres: R L Averill

VP: Joe Westhoff

SAGINAW MINE, Whatcom
County, Cu, Au, Ag

Under devel

FLOT MILL**SHERMAN MNG CO**

Rt 1, Box 113, Omak

Pres-Purch Agt: C C Sherman

VP: W E Sherman

Sec-Treas: Theo H Hohn

SHERMAN MINE, 3 mi W of
Omak, on Epley Rd, Ag, Pb,
Zn, Au, undergr

Gen Mgr: C C Sherman

W E Sherman, Theo H Hohn

Geol: W E Sherman

Under devel

50-TON FLOT GRAY MILL, at
mine

Under devel

SILVER BUCKLE MNG CO

Box 1086, Wallace, Idaho

BOYD LEASE, Stevens County

PETER'S LEASE, Stevens Co,
open pit, Ugo

Gen Supt: Geo L Cloward

Prod: 100-tons daily

500-TON MECH UPGRADING
PLANT, at mine

(See Idaho, Utah)

SPOKANE-IDAHO MNG CO

611 Peyton Bldg, Spokane 1

Pres: Frank N Marr

Sect: C D Randall

Treas: Charles E Marr, Jr

(See Idaho)

SILVER MTN MNG CO

3403 S Tacoma Way, Tacoma

Pres: Arthur G Nickelson

SILVER STAR MINE,
Tonasket area, Okanogan Co,
Ag, Au, Pb, Zn

Under devel

200-TON MILL, Tonasket

SPOKANE MNT URANIUM CO

PO Box 266, Lewiston, Idaho

Pres: Al Perri

INGRAM LEASE, Mt Spokane
area, Spokane Co, Ugo

SPOKANE NATIONAL MINES, INC</

WIND RIVER MNG CO
103 West 11th St, Vancouver
Pres: Everett N Philpott
VP-Purch Agt: George E Philpott
Sec-Treas: Kent M Nicolson
WIND RIVER MINE, near
Paradise Ck Camp, Skamania
County, undergr, Au, Ag
Gen Mgr: Everett N Philpott
Geol: David E Loughran
Under devel
PILOT MILL

WISCONSIN

**AMERICAN ZINC, LEAD
& SMELTING CO**
1515 Paul Brown Bldg
St Louis 1, Mo

VIRGILIAN HILL DIVISION MINE
Shullsburg, undergr, Zn, Pb
Gen Mgr: C A Dobbel
Gen Supt: J P Locke
Mine Supt: P J Mills
Mine Frm: E M Kreul
1900-PILOT MILL

Mine Frm: M Hendricks
(See Ariz, Ill, Mo, N Mex,
Ohio, Okla, Tenn, Tex, Utah,
Wash)

CUDA MNG CO
188 S Court St, Platteville
Mgr: J P Locke
Sec: H M Hoffman
Treas & Purch Agt: A W Helms
PIERSON MINE, Mineral
Point, undergr, Zn, Pb,
(subleased to Ivey Construction
Co)

Mgr: Roger Ivey
TEASDALE MINE, Benton
undergr, Zn, Pb (subleased to
New Teasdale Mng Co)
Mgr: John Cherry
Idle

**EAGLE PITCHER CO, THE
MNG & SMELTING DIV**
Box 1040, Galena, Ill
Gen Mgr: R L Haffner
Gen Supt: H N Haman
Geol: Wm Arndt

Maint Supt: C L Lyden
Mine Eng: V E Van Matre
Mine Supt: E L Houy
Mill Supt: C C Crow
SHULLSBURG MINE & MILL
Shullsburg, Zn, Pb

Prod: 1,200 tons
BIRKETT MINE, Hazel Green
Zn

Prod: 300 tons
LINDEN MINE, Linden, Zn
Prod: 350 tons

LINDEN MILL, Linden
(See Ill, Kans, Nev, Ohio, Okla)

**NEW JERSEY ZINC CO,
THE**
Box 232, Platteville
EXPLORATION STAFF
Res Geol: J M Hague
Geol: Wayne Zwickey
Idle

(See Colo, N J, N Mex, N Y,
Pa, Tenn, Va)

OGLEDAY NORTON CO
1200 Hanna Bldg, Box 8806
Cleveland 1, Ohio

MONTREAL MINE, 4 mi W of
Hurley, undergr, Fe
Prod: 3,000 tons daily
(See Minn, Ohio)

**PICKANDS MATHER &
CO, ODOHAH IRON CO**
Duluth, Minn

CARY MINE, Hurley, undergr
Supt: Russell L Jose
(See Mich, Minn)

**PIQUETTE MNG & MFG
CO**
1515 Paul Brown Bldg, St
Louis 1, Mo

MINE, Tazewell, Wisc, undergr
Zn, Pb concentrate
Gen Mgr: P B Piquette
Prod: 300 tons daily
MILL

Prod: 450 tons daily
(Joint Venture with AmeriCorp
Zinc, Lead & Smelting Co)

**PITTSBURGH PACIFIC,
CO**
ZONTELLI BROG DIV,
Ironton, Minn

MINES, Florence Co,
open pit
(See Minn)

VALLEY MNG CO
3522 W Linden Pl,
Milwaukee 3
Pres: C G Hendricks
(See Mont)

WYOMING

AMERICAN COLLOID CO
6100 Buffield Court, Skokie
Illinois

Pres: Paul Bachtner
VP: William D Weaver
Asst Sec-Treas: Jeanette Dismar
Purch Agt: Arthur G Clem
UPTON MINE, Upton, open
pit, bentonite clay
Gen Mgr: Orville Horn
Asst Gen Mgr: Donald Horn
Prod: 150 tons
250-TON MILL, Upton, drying
and grinding
(See Ill, Minn, S D)

**ANSCHUTZ DRILLING CO
INC**

1411 Mile High Center Bldg
Denver, Colo
FLY GROUP, Converse County
undergr, open pit, UO₃
(See Colo, Utah)

ANTELOPE MINES
Box 817, Casper
ANTELOPE MINE, Fremont
Co, UO₃

**ARCHER-DANIELS-
MIDLAND CO**
700 Investors Bldg,
Minneapolis, Minn
COLONY MINE, Crook Co,
Bentonite
UPTON MINE, Weston Co,
Bentonite
(See Minn)

B & H MINES
Rt 3, Douglas
MINE, open pit
Geol: P T Hornbuckle
Prod: 100 tons daily

**BALBOA MNG & DEVEL
CO**
Moorcroft

LAYMON LEASE, 20 mi N of
Moorcroft, UO₃
Explor

BARCO MINERALS INC
Box 432, Sturgis
South Dakota

Pres: Richard B Williams
VP: H B Braden
Sec-Treas: Ruth I Williams
SPOOKY JOE, Hulett, Crook
County, open pit, UO₃
Mine Supt: M H Braden
Geol: F R Williams
Mech Eng: D L Braden

BASIN ENGR CO
Baggs,
Pres: R K Lisco
VP: D L Hankins
Sec: W Adams

Prod: 20 tons daily
TETON MINE, undergr & open
pit, UO₃

Mine Supt: W M Addison

BENTON CLAY CO
P O Box 432, Casper

Pres: Fred Carr
VP & Gen Mgr: I Kreiner
Sec-Treas: Henry Burgess
BENTONITE MINE, Natrona
County, placer
Gen Supt: R E Goering
Geol: Fred Carr
Mech Eng: R E Goering
MILLS, Casper

BIG BEND MINING CO
1515 W Shore Drive, Loveland
Colorado

Pres: E L Pennington
Sec: H R Winkley
Treas: B R Winkley

MINE, 22 mi S of Jackson,
Address Box P P, Jackson,
placer, Au, Ag, iron oxide
Gen Mgr: B R Winkley
Gen Supt: E L Pennington

Geol: J P Hadfield
Mech Eng: J O'Malley
GRA MILL, at mine

**BIG HORN MNG & DEVL
CO**
3113 Kentworth Blvd
San Antonio, Tex

**CODY & BULL CREEK CLMS
MINES**, Park Co, UO₃

**BLACK HILLS
BENTONITE CO**
Moorcroft

Pres: H T Thorson
Gen Mgr: A C Harding
MINE, Moorcroft & Upton,
surface, bentonite
Mine Supt: W A Robinson
Prod: 200 tons
180-TON MILL, drying &
grinding
Plant Supt: Boyd Ash

**BLACK THUNDER MNG
CO**
801 So 8 Douglas

Part: Russell Twiford Jr,
Curtis Rockville
Sec-Treas: Purch Agt:
R Twiford Jr

PATEA, D & C MINE, 48 mi N
of Douglas, Converse County,
UO₃, undergr & open pit
Gen Mgr: Russell Twiford Jr
Mine Supt: Clayton Duffy
Asst Mine Supt: George McElfish

Prod: 25 tons

**CHAPMAN & MOREHOUSE
MNS CO**
618 Road Ave, Grand Junction
Colorado

Part: J L Chapman
G E Morehouse
MINE, Gas Hills Mng Dist,
Fremont Co, undergr & open
pit, UO₃

Mine Supt: D B Sigismund
Asst Mine Supt: D C Mahy
Prod: 200 tons daily

**COLORADO FUEL &
IRON CORP**
Banias

SUNRISE MINE, undergr, Fe
Supt: M L Sisson
Asst Supt: R L Wahl, Jr
Eng: H B Lynch
Ch Elect: R E Davis
Ch Chem: H A Roth
Mine Frm: A E Testolin
Prod: 3,100 tons
(See Colo, Utah)

**CONTINENTAL
MATERIALS CORP**
820 South 9th, Grand
Junction, Colorado

MINES, Crooks Gap, open pit
& undergr, UO₃
Gen Supt: Herbert Reynolds
(See Colo, Utah & Continental
Uranium Co of Wyo)

**CONTINENTAL
URANIUM CO OF WYO**
Box 1550, Grand Junction,
Colorado

Pres: Willard Gidwitz
VP: Joseph B Clear
Sec-Treas: Max Braun
Ch of Board: G S Gidwitz

SIESMIC MINE, Home on
The Range, undergr, UO₃
Gen Supt: C H Reynolds
Mine Supt: R K Dondero

Prod: 200 tons daily
(Co a subsidiary of Continental
Materials Corp, See Colo &
Utah)

COPPER KING MNG CO
Box 621, Cheyenne

Pres: Harry E Ferguson
VP: Andy E Rosdel
Sec: P A Dinneen

Treas: Harry E Ruckman
COPPER KING MINE, 22 mi W
of Cheyenne, open pit, Cu, Au,
Ag, Ti

Mine Eng: T L Johnston
(Laramie)

Under devel

COWAN, J L
418 N 4th St, Douglas

JUDY MO MINE, Converse
Co, UO₃

CRABTREE, JOHN M
Box 317, 410 S 4th, Douglas
MINE, UO₃

**CRYSTAL CREEK
GYPSUM CO**
843 W Main St, Lovell

Pres: Alfred Deschenes
VP: Herbert Daniels

Sec-Treas: H M Deschenes
**CRYSTAL CREEK GYPSUM
MINE**, Crystal Creek &
Hiale, open pit, gypsum
Under devel

DYE, CARL D
Box 144, Manderson
MINE, Washakie Co, UO₃

**FAIRFIELD-ANDERSON
& BEACH**
554 Washakie St, Lander

ANDRIA & GAS HILLS MINE,
Fremont Co, UO₃

**FEDERAL-RADOROCK-
GAS HILLS PARTNERS**
520 E Main St., Riverton

Gen Mgr: R W Neyman
Proj Mgr: R G Lindlof
Ch Acct: F Hell

Purch Agt: R Matson
**SAGEBRUSH, BUSS & CLYDE
MINES**, Gas Hills Dist, open
pit, UO₃ ore & concentrate

Mine Supt: E Bucy
Ch Eng: E C Iverson
Mech Eng: W Hall

Maint Supt: V MacGuffie
Mine Frm: V Compton
MILL, at mine

Mill Supt: R Shimmie
Ch Chemist: R Helm
Mill Frm: W Clark

(Under devel by Federal Uranium
Corp, Utah, See Conjecture
Mines Inc, Idaho)

**FOUR CORNERS OIL &
MINERALS CO**
1700 Broadway, Denver 2, Colo

MINE, Gas Hills, UO₃, open
pit, undergr
Gen Mgr: R R Bronson

Dir Nat Res: A Q Rydstrom
(See Colo, Utah & Largo
Uranium Corp, N Mex)

GADDIS MNG CO
1500 Mile High Center,
Denver, Colo

PAY DIRT MINE, Fremont Co
UO₃
(See Colo)

GILBERT, MARSE C
Box 771, Casper

**PRAEST LEASE, SABLE
& STATE LEASE MINES**,
Campbell Co, UO₃

JOYCE MINE, Pumpkin Butte,
surface, UO₃

GLOBE MNG CO
(Unit of Union Carbide Corp)
Box 1040, Grand Junction,
Colorado

GLOBE MINE, Riverton,
Converse County, open pit
UO₃

Gen Mgr: J L Lake
Mgr of Mines: J F Emerson
Mgr of Plants: A C Sada

Plant Supt: K W Lewis
Mine Supt: Robert Taylor
482-TON MILL, at mine

GOLDEN CLOVER CORP
Box 118, Encampment

Pres: H V Norris
MINE, Vermiculite

**GREAT WESTERN OIL
CO**
Box 2386, Mantridge Station
Las Vegas, Nevada

MINE, UO₃

**GREAT WESTERN SUGAR
CO**
Horse Creek

Mgr: M D Van Zee
MINE, Limestones, undergr

**GREEN MT URANIUM
CORP**
Lander,

Mgr: Elton Clark
MINE, Crooks Gap, UO₃

**GREEN RIVER OIL &
URANIUM CO**
26 W Broadway

Salt Lake City, Utah
**HAL, BART, EAGLE, SKOAL
GROUP**, Gas Hills area,
Fremont Co

VANADUM QUEEN MINE
(See Colo, Utah)

**HAMLIN EXPLOR &
MNG CO**
Gillette R, Midwest

HAMLIN-BUTTES #1 MINE,

8 mi SE of Lynch, Johnson
County, open pit, UO₃
Mine Supt: William C Hamlin
Prod: 3500 tons per year
**HAMLIN-TURNERCREST
#1 MINE**, 5 mi S of
Turnercreek, Converse County,
open pit, UO₃
Mine Supt: William C Hamlin
(See Calif)

**HANNA BASIN
CONSTRUCTION & COAL
CO**
P O Box 8122, Montclair St
Denver 20, Colorado

NUCKET MINE, Box 267,
Hanna, open pit
Prod: 1500 tons daily
(See Colo)

HAUPTMANN, IVAN J
1699 Washington Ave,
Hot Springs, S Dak

COLDSPOT MINE, Campbell
Co, UO₃
(See S Dak)

HERBSTROM, H O
2305 12th St, Rock Island, Ill

GEM H Q BIG HORN MINE,
Fremont Co, UO₃
(See Ill)

**HIDDEN SPLENDOR MNG
CO, THE**
1st Security Bldg

Salt Lake City, Utah
FEUSHER MINE, Box 967,
Lovell, UO₃, undergr

Mgr: R L Christie
Geol: James R Andrus
Prod: 25 tons per day

SAMSON MINE, Gas Hills
dist, undergr, UO₃
Geol: G W Forrester
Dist Supt: K A Noble

Mine Supt: John Russell
Under devel
(See Colo, Mont, N Mex, Utah)

**HOMESTAKE MINING
CO**
Lead, So Dak

HAUBER MINE, Halett,
undergr, UO₃

Mine Supt: C N Kravig
NEW HAVEN CLMS MINE,
Crook Co, UO₃

Asst Mine Supt: W C Campbell
Mine Frm: Norman Spilde
Prod: 100 tons daily
(See Calif, N Mex, S D, Utah)

**INTERMOUNTAIN
CHEMICAL CO,
(WESTVACO CHLOR-
ALKALI DIVISION OF
FOOD MACHINERY &
CHEM CORP)**

Box 672, Green River
Div Mgr: R J DeLargy
Purch Agt: R T Guest

WESTVACO MINE, undergr,
trams

Gen Mgr: R A Bondurant, Jr
Asst Gen Mgr: E L Stout
Gen Supt: R F Love

Geol: L K Norwest
Mech Eng: H F Young
Elec Eng: L Ruffin

Asst to Gen Mgr: W C Bauer
Mine Supt: T S Bernatis
Mine Frm: W F Peters

Mine Eng: W Z Wamsburg
2000-TON MILL, at mine
solution & recrystallization

Mill Supt: R Kvindahl
Mill Frm: R Bruce
(See Food Machinery & Chem
Corp, Calif, N Mex, & Nev)

**INTERNAT'L MINERALS
& CHEM CORP**
5401 Old Orchard Rd, Skokie
Ill

MINE, Crook County, surface
bentonite

Mgr & Purch Agt: K L Arthur
MILL, Belle Fourche, S Dakota
(See Ariz, Fla, Ill, Maine, Miss
N Mex, N C S Dak, Tenn, Va)

KELLEY, DARRY
P O Box 331, Gillette

INNES LEASE MINE, Campbell
County, UO₃

**KERR MCGEE OIL
INDUSTRIES**
Kerr McGee Bldg

Oklahoma City, Oklahoma
Casper Office, Midwest
Bldg, P O Box 319,
URANIUM prod

Dist Geol: F A Croth
Landman: Dale Trubey
(See Ariz, Colo, N Mex, Okla &
Kernac Nuclear Fuels, N Mex)

KING OIL CO
Box 389, Wichita Falls, Tex
CEDAR HILLS GRP MINE,
Carbon Co, U₃O₈

KUMMERFIELD, JOHN
Mooncroft
MINE, U₃O₈

LEVI, DALE B. COMPANY
1450 York St
Denver 4, Colorado
SECTION 18 MINE, Gas Hills,
open pit, U₃O₈
Gen Mgr: D B Levi
Asst Gen Mgr & Geol:
John R Lewis
Prod: 100 tons per day

LOGAN CHURCHILL & GARDNER
1202 5th St, Fairbury, Nev
MINE, in Wyo, U₃O₈

LOMA URANIUM CORP
316 Paramount Bldg
Denver, Colo
MINE, Converse County, open
pit, U₃O₈
Idle
(See Colo)

MAGNET COVE BARIUM CORP

Box 832, Greybull
Div Mgr: Lee Granter
MINE, 6 mi E of Greybull
surface, bentonite
Prod: 1500 tons daily
800-TON MILL, drying &
grinding
Mill Supt: Frank Hinkley
(See Ark, Fla, Mo, Nev, Tex)

MASEN, J L
226 E 2nd St, Casper
CAMP NO 1 MINE, Campbell
Co, U₃O₈

MICHAUD MNG CO
Box 506, Edgemont, S Dak
MINE, U₃O₈

MILE HIGH MINERALS INC
800 Petr Club Bldg
Denver, Colo
MINE, Fremont Co, U₃O₈
(See Colo)

MILLER & FENTRESS MNG CO
Box 526, Hemingford, Nebr
SUN 1 & 2 MINES, Campbell
Co, U₃O₈
(See Nebr)

MT HI URANIUM & OIL EXPLORATION
Sutess
Mgr: A Lampros
MINE, U₃O₈

MOUNTAIN MESA URANIUM CORP
Box 1488, Casper
SUNSET WILLOW BADLANDS
MINE, Fremont Co, U₃O₈

MRAK, VA
Douglas
PAT 8 & 9, MNG LEASE 594
& EULALIA MARKING
LEASE MINE, Converse Co,
U₃O₈

NADING, MELVIN V
Riverside Trailer Ct,
Casper
MINE, U₃O₈

NATIONAL LEAD CO, BAROD DIVISION
Box 1875, Houston 1, Texas
CLAY SPUR MINE, Box 122
Osage, open pit, bentonite
Gen Supt: J H Loth
DRY GRINDING MILL, Weston
County
(See Ark, Calif, Colo, La, Mo,
Mont, N Y, Tenn, Tex)

NORTH AMERICAN URAN INC
Box 484, Jamestown, N Dak
KEY 3 MINE, Campbell Co,
U₃O₈

NORTH CENTRAL MNG INC

Box 284, Casper
ALMA, BETTY, CAPPA &
NERO MINES, Campbell Co
U₃O₈

NORTHWEST URANIUM PROD CO
Con Royalty Bldg, Casper
RIDGE NO 1 MINE, Natrona
Co, U₃O₈

NORTHWESTERN CONSOLIDATE MNG CO
Box 45, Ft Collins 2, Colo
CAPPA & NERO MINES,
Campbell Co, U₃O₈
(See Colo)

NORTHWESTERN OIL & MNG CO
Box 164, Sheridan
EUREKA NO 2, RIDGE NO 1,
SKYLINE MINES, Fremont Co,
U₃O₈

OUTWEST URANIUM CO
633 Guaranty Bank Bldg
Denver, Colo
JAY MINE, Fremont Co, U₃O₈
(See Colo)

P C MNG CORP
Box 206, Riverton,
FANNIE MAE & THUNDERBIRD
MINE, Gas Hills, Fremont Co,
open pit, U₃O₈
(See N Y)

PEASE, C C (TRUSTEE)
P O Box 373, Sundance, Wyo
(See S Dak)

PETERS & KOENIG
Box 995, Riverton
HADES & ARROW CLM MINES
Fremont Co, U₃O₈

PETERSON, RICHARD L
Box 8, Douglas
Paris, Bruce Anderson and
Richard L Peterson
CERESITE #1 MINE, Douglas,
undergr, mica
Mine Supt: Al Eggers
Under devel
20-TON MILL, Wheatland,
grinding & screening

PILAR MNG INC
Box 931, Gillette
KAY 2 MINE, Crook Co,
U₃O₈

POWDER RIVER MINERALS INC
Box 253, Gillette
JAKE MINE, Campbell Co,
U₃O₈

PRATT SODIUM CO
Box 738, Casper
Omn: W E Pratt
MINE, Natrona Co, Sodium
sulfate

QUAD URANIUM CO
Hulet
Omn: James Sheffield, N C
McLane, Ted R Wagner
THE QUAD URANIUM MINE
Hulet, open pit, U₃O₈
Prod: 250 tons per month

RAMSEY, WILLIAM F
Gillette
SYL DEL MINE, Campbell
Co, U₃O₈

ROCK BUTTE PROPERTIES
Box 101, Lusk
MINE, Niobrara Co, U₃O₈

RYAN CONSOLIDATED VENTURE NO 2
2400 Republic Natl Bank
Bldg, Dallas, Texas
TRI-PLACER NO 4, Big
Horn Co, U₃O₈

SAN FRANCISCO CHEMICAL CO
Draeger P, Montpelier,
Utah

LEEPE MINE, 2 mi NW of
Sage, surface, phosphate
Mine Supt: Preston S Pugmire
Mine Frm: Frank Buck
Prod: 1,000 tons
(See Idaho, Utah)

SASSO & SIMMONS

Box 176
Partners: N A Sasso
J H Simmons
G S Sasso
E W Stamm
FOO 19 MINE, Shirley Basin,
undergr, U₃O₈
Prod: 100 tons per day
Under devel

SHAWANO DEVEL CORP

1645 Court Place
Denver 2, Colo
Pres: A K Swann
VP: Harry Bhumin, Karl S
Miras
Sec-Treas: J A Eskridge
MINE, Baggs, in Poison
Basin area W of Baggs, open
pit, U₃O₈
Gen Supt: Dean Poppsal
Idle
MILL, Baggs
Mill Supt: T L McKinney
Idle

SHAWNEE URANIUM & MWG
520 E Main St, Riverton
MINE, U₃O₈

SHIRLEY BASIN DEVEL CO

Box 882, Casper
Pres: Karl Meyers
VP: P Couper
(Property in Shirley Basin
under devel by Kerr-McGee
Oil Inds & Gas Hills Uranium
Corp)

J N SIMPLOT CO
Bank of Idaho Bldg,
Box 2777, Boise, Idaho
Exploration for Ruby Co,
Lander & Laramie, Fe
Green River, Tropa
(See Idaho, Mont)

SKYWAY EXPLORATION
Box 1087, Greybull
HIGH NOON 3 MINE, Big Horn
Co, U₃O₈

SOUTH PASS INC
832 CHF St, Lander
MINE, U₃O₈

SPERBERG, JOHN J URANIUM MNG & EXPLORATION
1412 11th Ave S
Minneapolis 4, Minn
NORTH STAR MINE, in Wyo
open pit, U₃O₈
Idle

SPLIT ROCK MNG CO
Kemmerer
MINE, U₃O₈

STORM, JAMES E
Hulet
MINE, U₃O₈

STRATEGIC MINLS LTD
% Dr K C Heald
605 Continental Life Bldg
Ft Worth 2, Tex
MINES, Albany Co, U₃O₈

SUNDANCE PETROLEUM & URANIUM CO
Box 203, Spearfish, S Dak
MINE, Crook & Johnson Co,
U₃O₈
(See S Dak)

SUSQUEHANNA WESTERN INC
777 Grant St, Denver 3, Colo
MINE,
Mgr Mng Div: G T Bator
Geol: S S Merwin
Under devel
550-TON MILL, Riverton
Mill Supt: G H Bryant
Frm: P V Bethurum
Eng: R F Stoker
Maint Frm: L A McGill

SWEETWATER CHEMICAL CO
6660 Military Ave, Omaha
Nebr
MINE, Carbon Co, Sodium
sulfate

THERMOPOLIS MNG & EXPL CO
739 Mondell St, Thermopolis
Mgr: A H Adams
SLEEPER NOS 1 & 2,
Pegmatites

TWIFORD MNG CO
801 South 6th, Douglas
Pres: Russel Twiford
VP: Irving Twiford
Sec: Russel Twiford Jr
D 21 MINE, Converse County,
open pit, U₃O₈
Gen Mgr: Russel Twiford Jr
Mine Supt: Bernard Duffy
Prod: 50 tons per day

TWO STATES URANIUM CO

Beautiful
REDWOOD MINE, Gas Hills
area, open pit, U₃O₈
Gen Mgr: M B Fagan
Geol: Kenneth McGriffin
Prod: 1,500 tons per month
(Co-owner with Hughes Mng
Co)
(See Nev, Utah, Peterson, M F
& Lorenz, Nev)

UNION CARBIDE NUCLEAR

P O Box 1169, Grand
Junction, Colorado
GLOBE MINE, Gas Hills,
Fremont County, open pit,
U₃O₈
(See Calif, Colo, Nev, N Y
Utah)

URANIUM CYCLE EXPL CO

Box 473
Belle Fourche
South Dakota
Pres: C Tenderholt
VP: Fred Hall
Sec: Lawrence Nabuska
Treas-Purch Agt: A L Jallon
HILMER & YELLOW STUFF
MINE, Box 624, Aladdin, open
pit, U₃O₈
Mine Eng: A J Katches
Prod: 28 tons
Under devel

URANIUM KING

Encampment
VANADIUM KING MINE,
Carbon Co, U₃O₈

URANIUM STRIKERS INC
Box 525, Gillette
PETE MINE, Campbell Co,
U₃O₈

URANIUM STRIP MINE
Edgemont, S Dak
MINE, Crook Co, U₃O₈
Mgr: Francis Michand

U. S. STEEL CORP COLUMBIA-GENEVA STEEL DIV
120 Montgomery St
San Francisco, California
EXPLOH, West Wyoming
near Atlantic City
(See Alaska, Ala, Calif, Minn
Pa, Tenn, Utah)

UTAH CONSTRUCTION & MNG CO
100 Rush St, San Francisco,
California

SHINLEY BASIN, Box 827,
Casper, mine loc: Shirley
Basin, U₃O₈
Gen Mgr: J H Bailey
Geol: L C Clark
Mine Supt: M Tilley
Under devel
LUCKY MC MINE, Masonic
Temple Bldg, Riverton, Gas
Hills Mng Dist, open pit, U₃O₈
Proj Mgr: J S Anderson
Asst Proj Mgr: Morton Pratt
Mine Supt: S A Nettman
Mech Supt: Ira McClure
Prod: 1000 tons daily
1000-TON MILL, Column Ion
Exchange, Gas Hills Dist

VALLEY DEAN CORP
Box 27, Bonanza, Utah
REDWOOD MINE, Gas Hills
Gen Mgr: M B Fagan
(Co-own with Two States
Uranium Co)
Prod: 75 tons per day
(See Utah)

VITRO MINERALS CORP
(Subsidiary of VITRO CORP OF
AMERICA AND ROCHESTER-
PITTSBURGH COAL CO)
800 W 33rd St
Salt Lake City 15, Utah
Pres & Gen Mgr: C J Potter

Sec: W H Denne, Jr
Treas: R T Ruder
Asst Gen Mgr: G H Young
Explor Mgr: C H Smith
WYOMING DIVISION MINE,
210 S Broadway, Riverton
Gas Hills, open pit, U₃O₈
Div Supt: Roy Coulson
Geol: R D Adam
Mine Frm: Primo Calabria
Prod: 400 tons per day
(See Utah)

VIPONT MNG CO

Box 602, Lander
Pres: Alfred Ellerby
VP: R M Thompson
Treas: L V Abbott

WAR BONNET URANIUM & MNG CO
684 Main St, Lander
RING & SANDUSKY GROUP
MINES, Fremont Co, U₃O₈

WASHAKIE URANIUM CO
1250 Oakl Ave, Thermopolis
EUREKA NO 2 MINE, Fremont
Co, U₃O₈

WENTE MNG ENTERPRISES
Raderville Route, Casper
BOSS & RIDGE NO 1 MINE,
Natrona Co, U₃O₈

WESTERN MINERALS DEVEL CO, INC UTAH CORPORATION
Vernal, Utah
Mgr: J B Freestons
MIRACLE MINE, Campbell Co,
U₃O₈
(See Utah)

WESTERN MINERALS INC
Box 543, Moon, Utah
JOE MINE, Converse Co, U₃O₈
(See Utah)

WESTERN NUCLEAR CORP
507 W Spruce St, Rawlins
Pres: Robert W Adams
VP: W T Adams
Sec-Assist to Pres: J A Larson
Asst Sec, Treas & Compt.
Roy J Jenkins

Purch Agt: W L McFarland
MINES, Jeffrey City, Crooks
Gap & Gas Hills, open pits,
U₃O₈
Res Mgr: Joseph W Joyce
Mng Eng: Don Conis
Mine Supt: Marcel Conis
Ch Geol: Eric Newman
Prod: 750 tons per day
845-TON MILL, Jeffrey City
Mill Frm: Frank Robertson
Mill Prod Supt.
Marcelle H Smith

WESTERN URANIUM CORP

1014 E Park, Riverton
Pres: J E Erickson
VP: J H Niemi
Sec: A Erickson
RIM MINE, Gas Hills
open pit, U₃O₈
Gen Mgr: W Erickson
Asst Gen Mgr: J Erickson
Gen Supt: Don Kelley
Geol: Bill King
Prod: 150 tons daily
STORM MINE, Hulet, open
pit, U₃O₈
Mine Supt: Don Kelley

WOLFSKILL, J F & MERLE
Hulet
MINE, U₃O₈

WYO-BEN PRODUCTS CO
Greybull
MINE, Bentonite, open pit
grinding plant

WYOMING MINES & METALS
Box 284, Casper
MINE, U₃O₈

ALLIS-CHALMERS PRODUCTS

Agglomeration Equipment
Agricultural Machinery
Algaecides
Anti-foams, Boiler Water
Arc Furnace Control
Betatrons
Boiler Feedwater Treatment
Breakers, Circuit (Power)
Car Shakers, (Railroad)
Circuit Breakers, Power
Clarifiers, for Water Conditioning
Classifying Equipment
Compacting Mills
Compressors, Axial, Centrifugal, Rotary
Condensers, Synchronous
Condensers, Steam
Construction Equipment
Contactors
Control, Electric Power
Converters, Copper
Converters, Electric
Coolers, for Cement Clinker, Chemicals
Core Dryers, Electronic for Foundries
Crushers, Gyratory, Jaw, Roll, Hammer
Deaerators, for Water Conditioning
Deflection Indicators, for Shafts, etc.
Deionizers or Demineralizers, for Water Conditioning
Dewaterers (Vibrating Screens)
Drives, Variable Speed
Dryers, for Rock, Ore
Earthmoving Equipment
Electronic Heaters
Engines, Gasoline, Diesel, Gas
Fork Lift Trucks
Foundry Shakeouts
Frequency Changers
Furnaces, Induction
Furnaces, for Ore Processing
Gearmotors
Generator Voltage Regulators
Generators, AC and DC
Graders, Road
Grinding Mills, and Media
Heaters, Induction and Dielectric
Heaters, for Rock, Ore, Grain, Chemicals
Hydroelectric Equipment
Kilns, Rotary
Log Washers
Magnetic Amplifiers
Material Handling Equipment
Mills, Blade, Grinding, Roller
Motor-Generator Sets
Motor Starters
Motors, Induction, Synchronous, DC
Motor Graders, Scrapers, Wagons
Nuclear Power Equipment
Pelletizing Equipment
Power Units (Engines)
Pulverizers
Pumps, Centrifugal and Axial
Pumps, Dry Vacuum
Rectifiers, Power
Regulators, Voltage
Regulators, Pressure (for Hydraulic Turbines)
Rheostats, Liquid
Road Machinery
Roller Mills
Screens, Gyratory, Vibrating
Scrubbers, Ore
Sifters, Gyratory
Slakers, Lime
Smelting Equipment, Ore
Softeners, Water (Commercial)
Starters, Motor
Substations, Indoor and Outdoor
"Package" Types
Switchboards (Custom Built)
Switchgear, Metal-Enclosed, Metal-Clad,
Indoor, and Outdoor
Tractors, Farm and Industrial, Wheel and
Track Types
Transformers, Power, Distribution, Instrument
Turbines, Steam, Hydraulic
Valves, Ball, Butterfly, Howell-Bunger,
Ring Jet, Rotovalve, Wafer
Washing Machinery, Rock and Ore
Water Treatment, Service, Chemicals,
Equipment

ALLIS-CHALMERS equipment for the METALLIC MINERALS INDUSTRIES



Allis-Chalmers is the world's largest manufacturer of equipment for the mineral industries. The wide variety of A-C products has brought together one of the most diversified groups of engineering specialists in all industry. That means you can get expert equipment recommendations from A-C.

There's no guesswork when you specify Allis-Chalmers Engineering. The A-C staff, working with your staff, analyzes your problem or process and looks for ways to make existing equipment "team up" with the new equipment for greater production. And the recommendation will be unbiased, because A-C builds many types and sizes of equipment. The selection will be dictated by exactly what you need, not an improvised arrangement.

Trained engineers in the Allis-Chalmers Research Laboratories help solve tough problems by testing samples of your product. This is another precaution to make sure that exactly the right equipment is selected for your particular plant.

And Allis-Chalmers not only builds the basic machinery, but also the motors and control needed to run it—it is the only company that builds all this machinery in its own shops. This means a "packaged" unit or process, with every part engineered to work efficiently with every other . . . assures you of higher efficiencies, lower costs, undivided responsibilities. And Allis-Chalmers stands behind every unit 100%! Sales offices and representatives are located near you . . . in all principal mining areas of the free world.

ALLIS-CHALMERS

969 South 70th Street, Milwaukee, Wisconsin



25 C 7949G

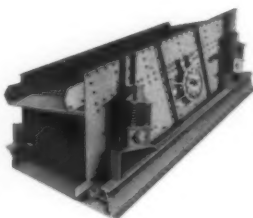
VIBRATING SCREENS ... a complete line

SELECTION GUIDE	Maximum Feed Size (inches)	Aperture Range (inches)	Screen	Common Sizes (feet)
Scalping—ahead of Jaw Crushers.....	36	3 to 10	ROM Model XXH	5 x 10 to 6 x 14
Scalping—Following primary crushers.....	20	1 to 10	Model XH	4 x 5 to 6 x 16
Scalping—Following secondary crushers or hammermills.....	6	¼ to 5	Model SH	3 x 6 to 6 x 16
Dry Sizing.....	6	40 mesh to 5	Model SH	3 x 6 to 6 x 16
Dry Sizing.....	5	½ to 2½	Low-Head	3 x 6 to 8 x 20
Dry Sizing.....	4	40 mesh to 3	Model S	3 x 6 to 4 x 10
Dry Sizing.....	4	40 mesh to 1½	Model AVS	3 x 6 to 4 x 10
Wet Sizing and Washing.....	6	40 mesh to 5	Model SH	3 x 6 to 6 x 16
Wet Sizing, Washing and Dewatering.....	5	¼ mm to 2½	Low-Head	3 x 6 to 8 x 20
Wet Sizing.....	4	40 mesh to 3	Model S	3 x 6 to 4 x 10
Wet Sizing.....	4	40 mesh to 1½	Model AVS	3 x 6 to 4 x 10
Media Recovery and Washing.....	8	¼ mm to 2 mm	Low-Head	3 x 12 to 8 x 20
Thickening, Dewatering and Filtering.....	¾	¼ mm to 1 mm	Low-Head	3 x 12 to 8 x 20

Model XXH ROM inclined screens

For the heaviest scalping problems

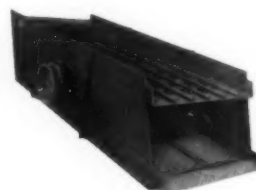
Model XXH ROM screens are of heavy steel construction with balanced, two-bearing cartridge-type mechanism. May be obtained with plate or stepped grizzly bar decks. Max. opening—10 to 11½ inches... 1 or 2 decks. Send for Bulletin 07B8368.



Model XH Extra Heavy Duty inclined screens

For wet or dry scalping and coarse sizing

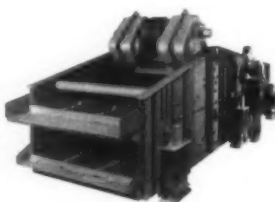
Model XH *Ripl-Flo* screens have balanced two-bearing mechanisms and may be obtained with perforated plate, rod or stepped grizzly bar decks. Max. opening—10 inches... 1, 2 or 3 decks. Send for Bulletins 07B6151 and 07B7868.



Low-Head Heavy Duty horizontal screens

For moderate to heavy sizing, coarse to fine, wet or dry, thickening dewatering, media recovery and rinsing.

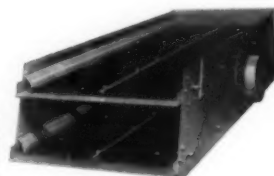
Low-Head screen operation saves headroom and space. Conveniently mounted mechanism imparts a straight line motion to screen. Max. opening—2½ inches... 1, 2 or 3 decks. Send for Bulletins 07B6330 and 07B7368.



Model SH Standard Heavy Duty inclined screens

For moderate to heavy sizing, coarse to fine, wet or dry, light scalping and rinsing

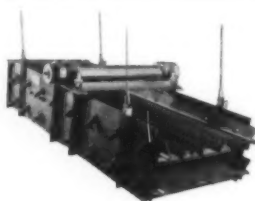
Model SH *Ripl-Flo* screens have balanced, two-bearing mechanism and are designed for a wide range of applications. Max. opening—5 inches... 1, 2 or 3 decks. Send for Bulletins 07B6151 and 07B7868.



Model AVS Standard Duty inclined screens

For fine sizing, wet or dry

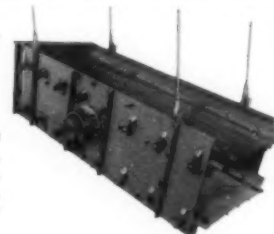
Model AVS *Aero-Vibe* screens have two-bearing mechanism located above the body. Gives top screening efficiency at lowest possible cost. Max. opening—1½ inches... 1, 2 or 3 decks. Send for Bulletin 07B6099.



Model S Standard Duty inclined screens

For moderate, wet or dry sizing

Model S *Ripl-Flo* screens are sturdy, low cost screens... have two-bearing mechanism. Max. opening—3 inches... 1, 2 or 3 decks. Send for new Bulletin 07B8229.



MATERIALS HANDLING EQUIPMENT

CAR SHAKERS
TRACTORS AND GRADERS
MOTOR WAGONS

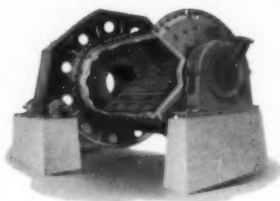
WASHING EQUIPMENT

BLADE MILLS
LOG WASHERS
POOL WASHING SCREENS

PYRO-PROCESSING EQUIPMENT

ROTARY KILNS...
For sintering, nodulizing, pelletizing, agglomerating, calcining
BALLING DRUMS
AIR QUENCHING GRATE COOLER
CONVERTERS
ROTARY COOLERS, DRYERS
FURNACES

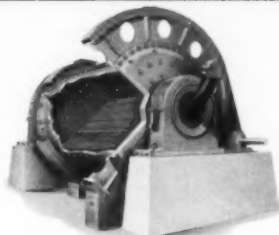
GRINDING MILLS . . . all types



Overflow Rod Mill

Sizes 3 to 11½ ft diameters, 6 to 16 ft lengths. Rod mill product can be varied from 6 to 35 mesh, with a minimum amount of fines. Because a rod mill can reduce a one inch slot size feed, it has supplanted the last stage of crushing in many plants. The screening action of the rods within the mill produces an ideal ball mill feed, free from tramp oversize, without the use of close circuiting screens.

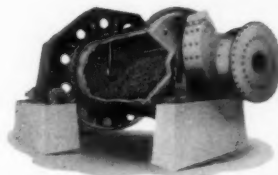
Bulletin 07B6718.



Peripheral Discharge Rod Mill

Sizes 3 to 11½ ft diameters, 6 to 16 ft lengths. The peripheral discharge rod mill was developed for those dry grinding circuits where close control is required for either the product top size or the fines. In addition to these dry grinding applications, either the end peripheral or the center peripheral discharge rod mill may be used in wet circuits where specific product requirements must be met.

Bulletin 07B6718.



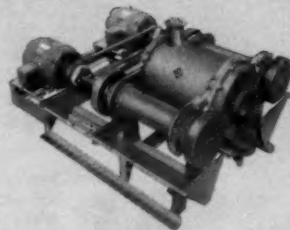
Ball Mills

Sizes 3 to 13 ft diameters, 3 to 17 ft lengths. For producing a finely ground product of 28 to 325 mesh from a feed size of about ½ inch. Ball mills are unsurpassed for the fine grinding of moderately to extremely abrasive materials.

Overflow type ball mills are used for fine wet grinding in closed circuit with a classifier. Diaphragm type ball mills are universally used for fine or coarse, wet or dry grinding in closed circuit with a classifier, screen or air separator.

Bulletin 07B6718.

NEW



Vibrating Ball Mills

For small capacity applications, wet or dry grinding

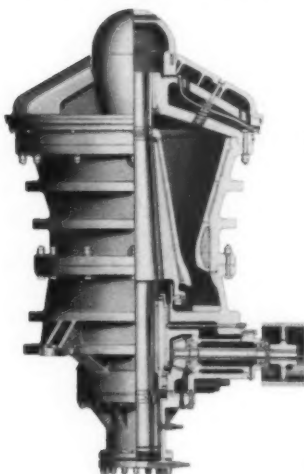
The VBM, a high capacity, exceptionally efficient grinding mill out-produces a tumbling mill 15 to 30 times per unit volume. Applications range from hard-to-grind abrasives to chemicals, foods, pharmaceuticals, pigments.

Versatile VBM can reduce a variety of products to specification . . . from coarse to very fine micron size.

15-inch and 30-inch diameter mills with capacities up to 1 tph and 5 tph, respectively.

Bulletins 07B7138 for 15 inch, and 07B9582 for 30 inch.

CRUSHERS FOR EVERY MINING JOB



Superior Gyratory Crushers

For high capacity primary or secondary crushing

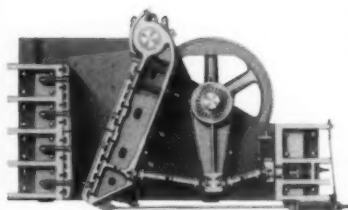
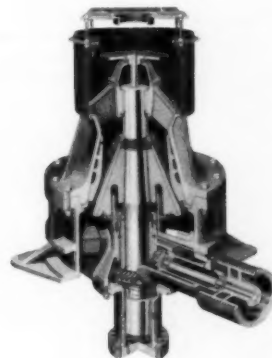
Twelve sizes . . . 16-50 to 60-109 (60 inch feed opening, 109 inch diameter cone at crushing point). Capacity 170 to 3500 tph. Available with *Hydroset* mechanism or spider suspension. Bulletin 07B7870.

Hydrocone Gyratory Crusher

For high capacity secondary or tertiary crushing

Twenty-one sizes . . . 122 to 1784 (17 inch feed opening, 84 inch diameter cone at crushing point). Capacity 7 to 1050 tph. Equipped with *Hydroset* mechanism. Bulletin 07B7145.

The *Hydroset* mechanism adds flexibility to gyratory crushing . . . an hydraulic mainshaft support which compensates for wear, adjusts product size and facilitates clearing of crusher in case of power failure or unexpected shutdown.



Model ST Jaw Crusher

For crushing moderately hard material with minimum fines

Five sizes . . . 18x30 to 42x54 inch feed openings. Capacity, 75 to 650 tph. Bul. 07B8595.

Blake Jaw Crushers

For moderate capacity crushing of hard materials

Five sizes . . . 10x7 to 30x18 inch feed openings. Capacity, 6 to 90 tph. Bulletin 07B7090.

Fine Reduction Jaw Crusher

For crushing 7 inch and smaller feed to 50% passing ¼ inch in one operation

Two sizes . . . 18x9 and 24x10 inch feed openings.

Bulletin 07B6425.

Roll Crushers

For fine crushing of hard material with minimum fines

Double-roll crushers are driven by large flywheel sheaves. Roll diameters from 9 to 78 inches. Bulletin 07B6180.

For crushing large tonnages of laminar rock

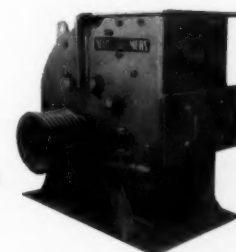
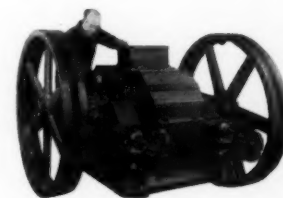
Single roll *Fairmount* crushers, two sizes . . . 24x84 and 36x60 inch rolls. Write for more information.

Pulverator Hammermill

For pulverating non-abrasive materials

Hammers reduce material by multi-impact . . . large ratio of reduction. Handles up to 4 inch feed. Five sizes . . . capacity 2½ to 125 tph.

Send for Bulletin 07B6265.



A-1 Jaw Crushers

For primary crushing of tough, abrasive material in blocky feed sizes

Four sizes . . . 36x25 to 60x48 inch feed openings. Capacity, 200 to 660 tph.

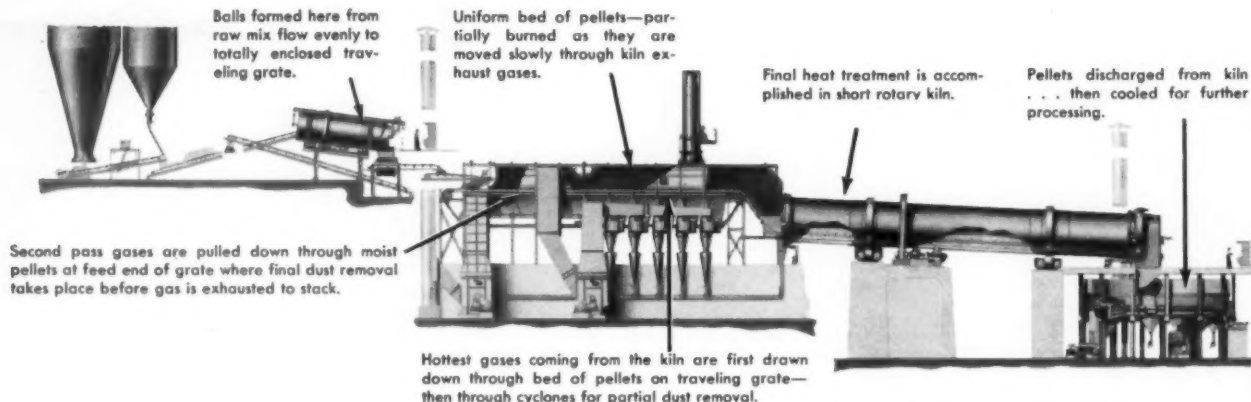
Bulletin 07B6369.

THE GRATE-KILN SYSTEM

The GRATE-KILN System is a new approach in pyro-processing involving preheating, burning and cooling. The system has been adapted to the following applications that result in the highest quality product at the lowest cost:

Agglomerating phosphate sands, iron ores, refractory materials
• Calcining lime • Dead burning of dolomite, magnesite.

Typical system capacities: Iron ore—1000 to 4000 long tons per day, Lime—200 to 600 tons per day.



Balls formed here from raw mix flow evenly to totally enclosed traveling grate.

Uniform bed of pellets—partially burned as they are moved slowly through kiln exhaust gases.

Final heat treatment is accomplished in short rotary kiln.

Pellets discharged from kiln . . . then cooled for further processing.

Second pass gases are pulled down through moist pellets at feed end of grate where final dust removal takes place before gas is exhausted to stack.

Hottest gases coming from the kiln are first drawn down through bed of pellets on traveling grate—then through cyclones for partial dust removal.

MOTORS FOR EVERY DRIVE

SUPER-SEAL MOTORS are one of the latest cost saving developments to come from Allis-Chalmers. These motors are built in two general types. One of them is insulated with *Silco-Flex* all-silicone-rubber insulation that has extreme resistance to dust and moisture and is repellent to surface water. The other has stators molded in epoxy-resin which provides a permanent shield against moisture and contamination. Open type Super-Seal motors may be used in most applications that formerly required enclosed motors. They are available from the smallest to the largest ratings. Bulletin 51B9040.



DRIP-PROOF—New NEMA rerated squirrel cage motors are available in standard ratings starting at ½ hp. Their better protection against foreign matter helps keep maintenance costs low. Bulletin 51B6210.



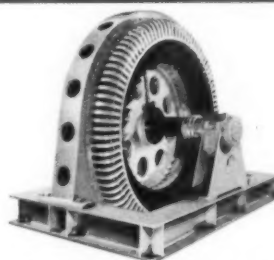
TOTALLY ENCLOSED FAN-COOLED—Ideal for dirty, dusty, oily, humid, corrosive, and outdoor locations. Rapidly moving air from the cooling fan keeps most dirt from settling on motor. Easily cleaned. 51B7725.



WOUND-ROTOR MOTORS—For constant speed duty requiring frequent reversing or starting under heavy load. Adjustable-varying speed loads. High starting torque applications, such as crushers, kilns, blowers. 51B8195.



LARGE CAGE MOTORS—Built in sizes to meet all industrial, power plant, and special application requirements. Construction shown is available from 60 hp at 300 rpm to 2000 hp at 1800 rpm. 05B7542.



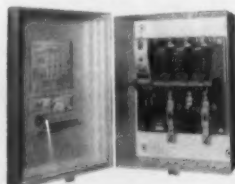
SYNCHRONOUS—Built in ratings from 40 hp up for a wide variety of speeds, including 3600 rpm motors in the larger sizes. Have high efficiency. Improve plant power factor for reduced power costs. 05B8183.



WEATHER-PROTECTED—Design simplicity and the ability to operate under the most severe weather conditions are combined in this weather protected motor. Sizes from 250 hp up. Bulletin 51B8606.

CONTROL FOR EVERY MOTOR

Allis-Chalmers makes a line of starters to meet practically all motor control needs. Count on this wide range of starters, backed by industry-wide application engineering experience, for the answer to your control needs. Ask for Bulletin 14R7988.



Power Distribution

Allis-Chalmers also supplies a complete line of power distribution equipment to mining plants. This includes power, distribution, and instrument transformers; indoor and outdoor switchgear and unit substations; circuit breakers; power rectifiers.

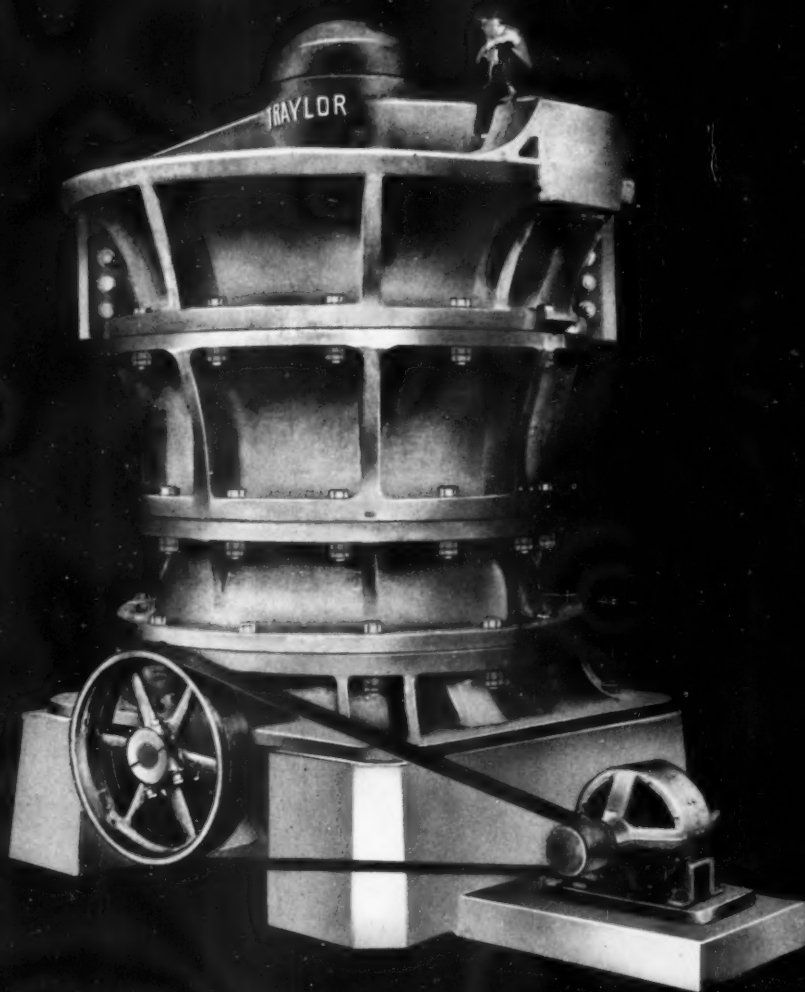
Tractor Equipment

Allis-Chalmers has geared its development progress to the earth moving and material handling needs of the mining industry and is supplying crawler tractors, tractor shovels, pull scrapers, motor scrapers, motor wagons, motor graders, and power units.

ALLIS-CHALMERS

969 South 70th Street, Milwaukee 1, Wisconsin

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TRAYLOR-MADE

**TRAYLOR ENGINEERING & MANUFACTURING
DIVISION OF FULLER COMPANY**

1620 MILL STREET, ALLENTOWN, PA.

12-129

TRAYLOR BULLDOG GYRATORY CRUSHER

Type TC is the most advanced design of large capacity gyratory crushers. Built in six sizes with capacities ranging from 245 tons of a 2" product to 4100 tons of an 11" product, these gyratories feature Traylor original non-choking, self-tightening bell heads and curved concaves. Massive construction provides for shock absorption and, at the same time, all parts are readily accessible for maintenance. The Traylor patented dust seal provides a practical and efficient device for excluding dirt from the lubrication chamber. All of the features you want in your crushing machinery can be found in the Traylor TC Gyratory Crusher.



TRAYLOR . . . a name
that means the very best
in mining machinery,
manufactures . . .

Gyratory Crushers

Jaw Crushers

Rotary Kilns,

Coolers, Dryers

Grinding Mills

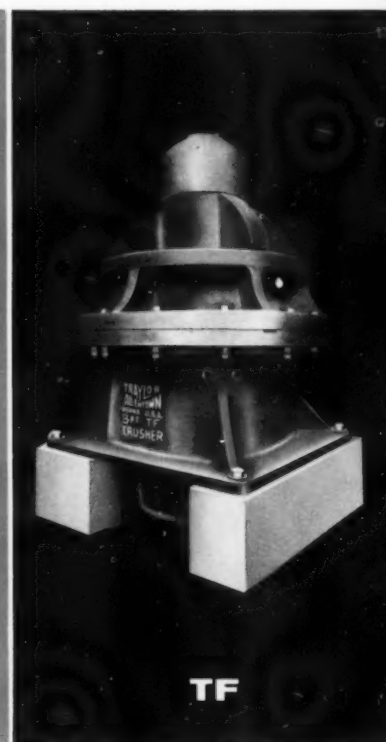
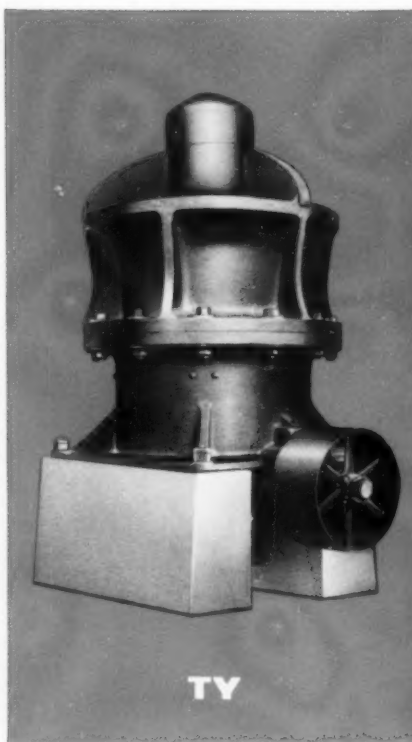
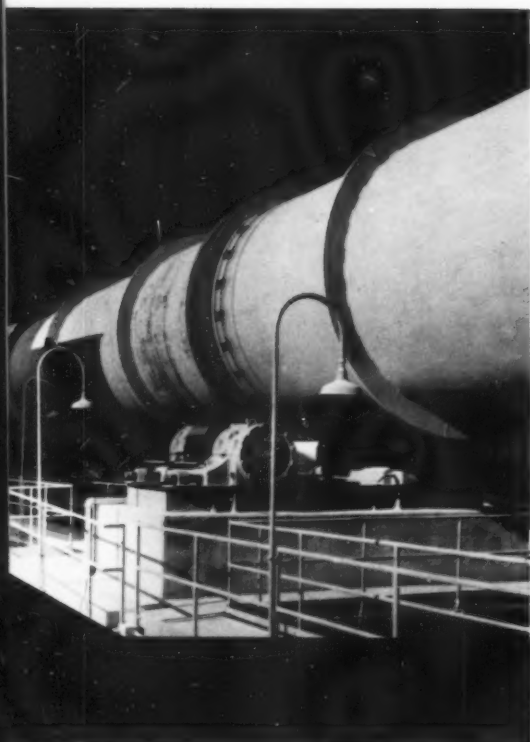
Feeders

**Copper Convertors,
Casting Machines**



ROTARY CRUSHING

offer operating efficiency



ROTARY kilns

Hundreds of rotary kilns have been engineered, fabricated and delivered by Traylor Engineering. High standards of craftsmanship have produced the finest thermo-processing equipment available for calcining, roasting, chloridizing, volatilizing, sintering and nodulizing. The shells of Traylor-Kilns are made of heavy steel plate, automatically welded together, and Traylor engineers pioneered in the perfection of the easy aligning single roller supports. The full solid floating type of tire is mounted securely in place on the shell, and the main gears and pinions, made of steel, are reversible. Traylor Kilns have been built to 12'-0" diameter, 450'-0" long. For details on Traylor Rotary Kilns, Coolers, Dryers and Slakers, write for Bulletin No. 1115.

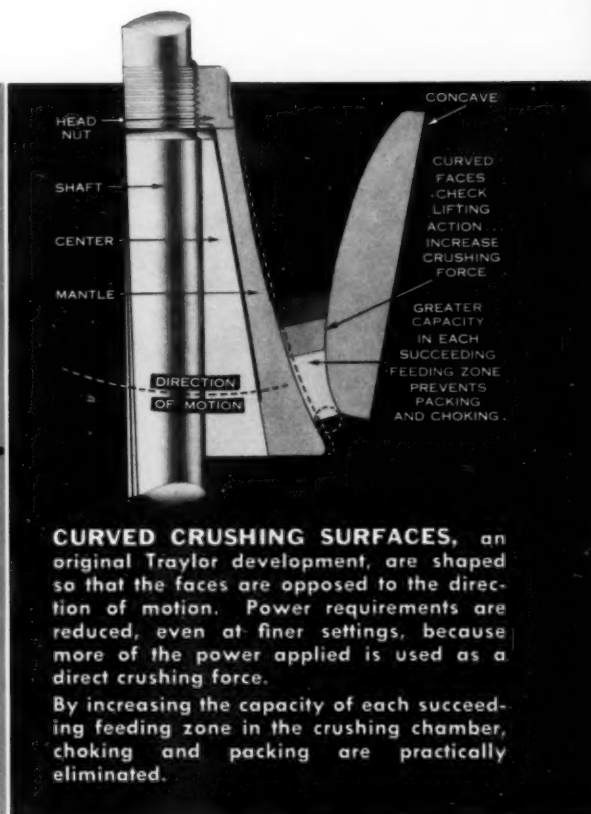
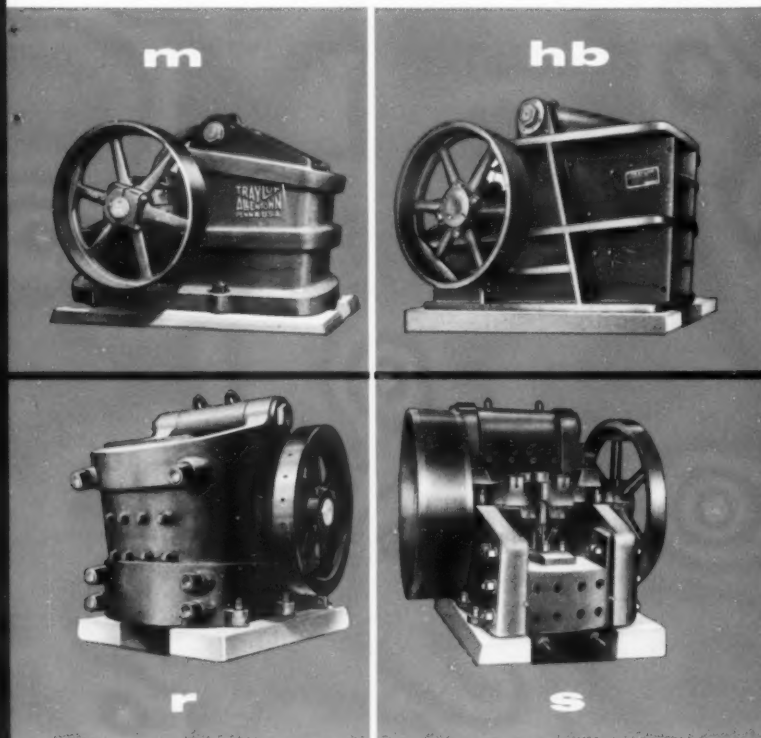
SECONDARY crushers

Traylor makes two types of reduction crushers: the TY in six sizes from 1'-3" to 5'-6" with feed openings from 3" to 22", and the TF Fine Reduction Crusher for operators whose needs demand economic production of $\frac{5}{8}$ " to $1\frac{1}{4}$ " material in large capacity. Both types require less head room because of their compact, simplified design and Traylor original curved concaves and self-tightening bell heads are used in the TY and TF Crushers. The design, construction and operational features embodied in these reduction crushers are the direct result of Traylor's long and diversified experience and leadership in the ore and stone crushing field.

NEW YORK: 3416 Empire State Bldg. PE 6-0350
CHICAGO: 1213 Fisher Bldg. 343 S. Dearborn St. WE
SAN FRANCISCO: 564 Market Street YU 1-0677

KILNS AND MACHINERY

and long-life economy



CURVED CRUSHING SURFACES, an original Traylor development, are shaped so that the faces are opposed to the direction of motion. Power requirements are reduced, even at finer settings, because more of the power applied is used as a direct crushing force.

By increasing the capacity of each succeeding feeding zone in the crushing chamber, choking and packing are practically eliminated.

JAW crushers

Traylor Jaw Crushers are built in four types with 18 different size feed openings. Capacities range from four tons of $\frac{3}{8}$ " material to 1,000 tons of 11" material per hour. The four types of Traylor Jaw Crushers are One Piece Cast Steel, One Piece Welded Steel Plate, Sectionalized Cast Steel and Steel Plates, and Meehanite Iron, and all four are precision built to perform their rugged task efficiently. As the result of more than a half-century's experience in building crushers, Traylor has developed one of the most advanced groups of jaw crushers.

Traylor's patented swing jaw suspension and originally developed curved jaw plates account for greater capacity at finer settings and longer life of jaw plates. Traylor's curved jaw plates will outwear ordinary plates as much as 3 to 1. All frames are reinforced at critical points to provide strength without excessive weight. For more information on Traylor-Made Jaw Crushers, state your requirements and a bulletin will be forwarded to you immediately.

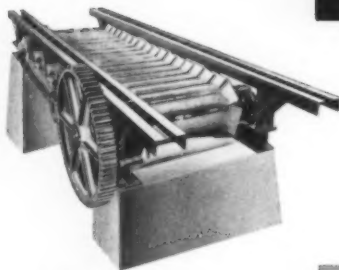
FOREIGN SALES AGENCIES: Lima, Rio de Janeiro, Buenos Aires, Santiago, Antofagasta, Oruro, La Paz, Montevideo, S. A.; Madrid, Spain; Oslo, Norway; San Juan, Puerto Rico; Manila, P. I.; London, England.

AUSTRALIAN MANUFACTURER: Jaques Bros., Richmond E-1, Victoria, Australia

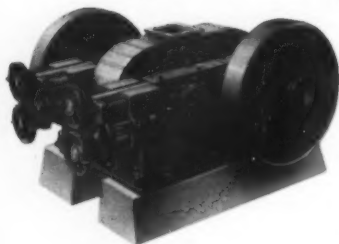
CANADIAN MANUFACTURER: Canadian Vickers, Ltd., P. O. Box 550, Place D'Armes Station, Montreal, P. Q., Canada

other fine **TRAYLOR-MADE** *products*

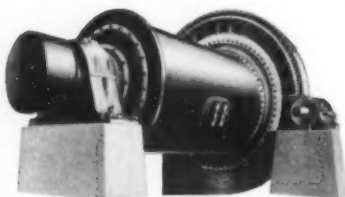
in use by the mining industries throughout the world



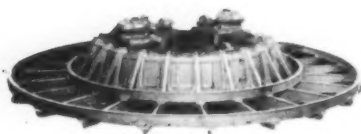
TRAYLOR FEEDERS are made in four types specially designed for application in the several steps of crushing, grinding, drying or calcining. These four are the Sheridan Grizzly Feeder, the Apron or Pan Feeder, the Table Feeder and the Slurry Feeder. Grizzly Feeders are made in sizes from 3'-0" x 6'-0" to 10'-0" x 20'-0" and Apron Feeders are adapted to the size and kind of material to be handled. Feeders are made in widths of 30" to 84" in any length required. All Traylor Feeders are adapted to the size and kind of material to be handled and are easily adjusted to vary their rate of delivery of material. For more on Traylor Feeders write for Bulletin No. 2114.



TRAYLOR CRUSHING ROLLS are built in three types. The Four Tension Rod type is capable of delivering large capacities and standing up under the most severe continuous service. Type AA and A Rolls are designed for lighter service. The range in size of the three rolls is from 18" dia. x 10" face to 78" dia. x 24" face with tension springs to develop pressures up to 40,000 lbs. per lineal inch of roll face. Write for Bulletin No. 6637.



TRAYLOR GRINDING MILLS are available in Ball, Rod, Compartment and Pebble Mills. Made in two types, overflow and diaphragm discharge, Traylor Ball Mills are built for either wet or dry grinding. They feature shell liners of manganese, high carbon, or chrome moly steel or nickel iron in plain, wave, cascade, lifter or rolled types with shells of welded steel construction. Trunions are cast integrally with the heads. Main bearings are made of Meehanite metal with larger sizes fitted with a high-pressure Alemite pump. Steel driving gears are precision-cut on Traylor's Maag gear generator. For full details on Traylor Grinding Mills write for Bulletin No. 11-121.



TRAYLOR CASTING MACHINES are built in two types: Circular and Straight Line. The heavily proportioned Circular Casting Machine is driven by two motors through separate gear trains, but with a single control. It is designed to run in either direction. The track is conical, and the turn-table supporting the mold platform runs on flanged conical rollers. Traylor Casting Machines have been built in sizes up to 40'-0" and can be designed for anode, cathode, wire bar or pigs. Write for complete information.

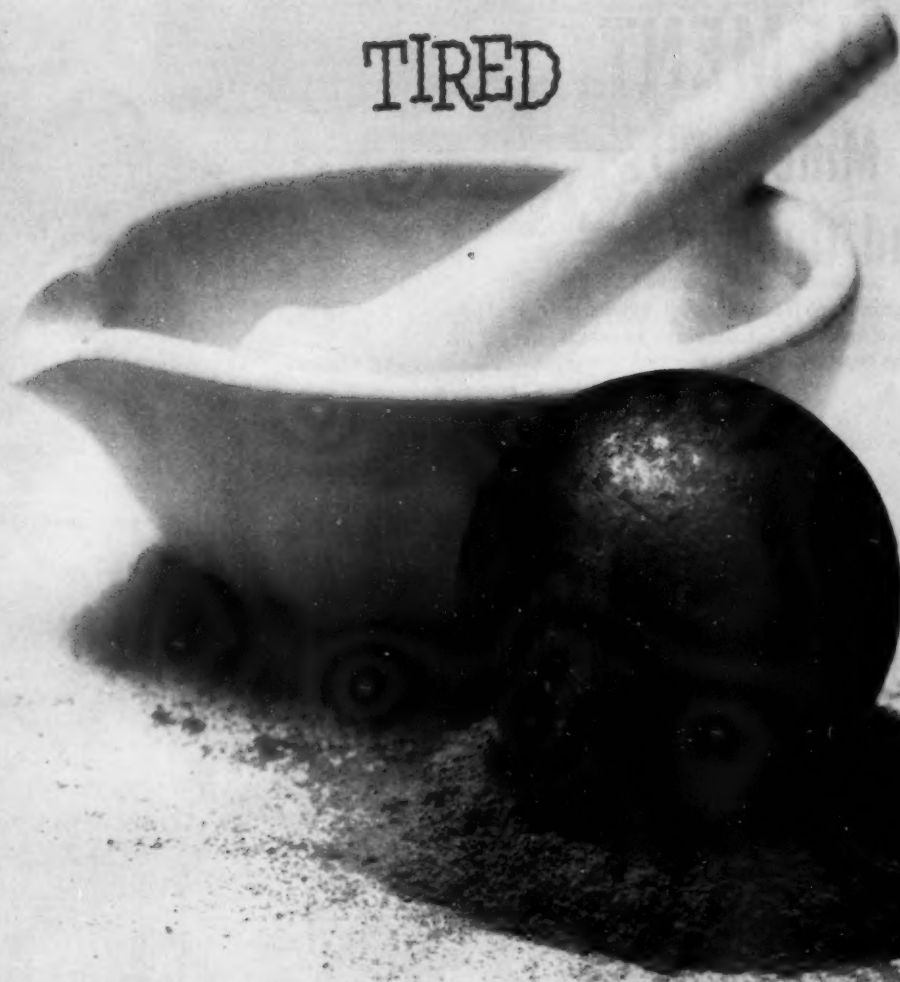
TRAYLOR-MADE

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Coates Grinding Balls grind better, last longer and wear more evenly because they are carefully made of special formula fine-grained, high-carbon steel, checked and calibrated to be more perfectly round . . . scientifically heat treated to the very core, to be tough and rugged.

Call for Coates Triple-Forged Grinding Balls . . . built with care for longer wear. Write for prices . . . All sizes— $\frac{1}{2}$ " to 5" carried in stock for immediate shipment.

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Descriptive bulletins are available on the equipment shown here. Write for copies today.

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50 YEARS EXCLUSIVELY ENGAGED IN THE MANUFACTURE OF SEPARATING AND SIZING EQUIPMENT



SuperDuty

DIAGONAL-DECK Ore Tables

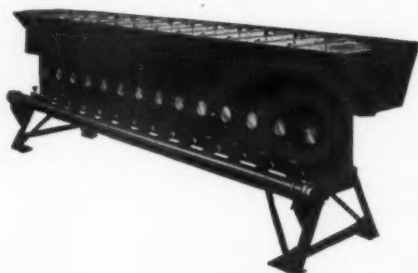
These DIAGONAL-DECK Concentrating Tables have been accepted as the standard the world over for more than a quarter of a century. Leading this line of outstanding and time proven tables is the *SuperDuty* DIAGONAL-DECK table, firmly established by substantial commercial applications as the most advanced in features, performance and practical advantages.

CONCENCO® DISTRIBUTORS

The CONCENCO Revolving Feed Distributor, built in six types, is a heavily fabricated, all steel machine with motor drive requiring only $\frac{3}{4}$ H.P. in operation. The Distributor effects perfectly a splitting of feed sluiced to its revolving tank, into any desired number of equal portions from two to sixteen, in some cases more. It is especially suitable for efficiently feeding any number of circuits or machines in battery for higher overall efficiency. It is unexcelled for feeding concentrating tables.



CONCENCO® CPC Classifiers



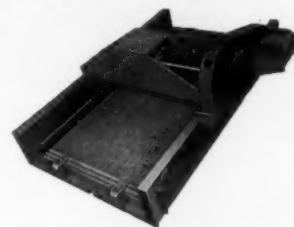
CONCENCO Constriction Plate Classifiers of all steel welded construction are furnished in any number of cells from 2 to 14 to meet requirements. Each cell is square in horizontal cross section and consists of three chambers: the pressure chamber at the bottom; the sorting column immediately above and separated from the pressure chamber by a constriction plate; and the launder section above the sorting column, which is materially increased in cross section to reduce velocity of flow.

The CONCENCO SuperSorter (Giant Classifier) available in multiple cells, handles feed in excess of 100 tons per hour producing accurately sized products.

Leahy® SCREEN . . . New Model E Now Available with FlexElex Heating of the Jacket

Due to their rugged construction and mechanical simplicity, Leahy Vibrating screens far outdistance other devices in overall equipment life.

The heavy duty vibrator, doubly dust-proofed type and enclosed, and forming an integral part of the structural steel bridge assembly, delivers a stronger and more positive vibration than ever before, superenergizing every square inch of screen jacket with the characteristic stratifying-screening-unblinding vibration, that is so highly acclaimed and profitably enjoyed by Leahy screen users. Leahy differential vibration guarantees open meshes, which in turn insure higher screening efficiency and capacity.



The Guaranteed Screen

Uses—For wet or dry screening from 3" opening down to fine mesh; also for dewatering and heavy media recovery. Unexcelled for screening at fine meshes.

Features—The new Model E Leahy Screen has simplicity combined with proved ruggedness. Installation is inexpensive, with supports figured for dead load only, because no vibration goes into the screen frame or supports, and only $\frac{1}{2}$ H.P. is used to operate. The heavy duty vibrator, running-in-oil at 265 r.p.m., produces 1200 to 2000 v.p.m. as needed. Maintenance is negligible—averaging less than 1% of first cost annually. Screen jacket economy is reflected in costs as low as \$0.000574 per ton treated. The quickest jacket change feature offered in screening equipment combines with the use of reasonably priced jackets of woven wire and, with some models, perforated plates.

Types and Sizes—Open type, totally enclosed dustproof type; single or double surface; belt drive or motor drive in sizes: 17x32 in.; 2x4 ft.; 3x5 ft.; 3x6 ft.; 3x7 ft.; 4x5 ft.; 4x6 ft.; 4x7 ft.; 4x8 ft.; 5x6 ft.; 5x7 ft.; 5x8 ft. Size designation indicates the overall dimensions of the screen jacket. *Special sizes built to order.*

CONCENCO Spray Nozzle—Water Sprays

CONCENCO Spray Nozzles are unique and efficient. They are easy to apply. A hole is drilled in the pipe and the nozzle bolts on by means of a brass "U" bolt. No threading is necessary. The jet is a flat line spray very effective in washing or screening. The jets can be perfectly aligned one with another for sheet flow washing. The J-132 series with orifices of $\frac{1}{8}$ " to $\frac{3}{4}$ " fit 1" to 2" pipe. The J-136 series with orifices of $\frac{1}{16}$ " to $\frac{3}{4}$ " fit 2" to 4" pipe.



WRITE FOR CATALOGS

Patents on equipment owned or controlled by The Deister Concentrator Co. Trade-marks registered in U.S. and foreign countries.

CATALOG, SURVEY & DIRECTORY NUMBER, 1960



NC-1 MINE
CAR TRUCKS



NATIONAL
CUSHIONING UNITS

*every day, every year more and more
mine cars and locomotives are equipped
with*

NATIONAL DEVICES

No matter whether you're considering the purchase of new mine cars or locomotives . . . or whether you're thinking of upgrading existing equipment *now* is the time to investigate the advantages of National devices.

For every day cost-conscious operators everywhere are switching over to National devices because they know they get more out of their equipment investment per workshift . . . per day . . . per year.

AA-6732

NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY
Established 1868 Cleveland 6, Ohio

• WILLSON AUTOMATIC COUPLERS • RUBBER CUSHIONED UNITS • NACO STEEL LINKS
and SWIVEL HITCHINGS • MINE AND INDUSTRIAL CAR TRUCKS • NACO STEEL WHEELS

CANADIAN SUBSIDIARY

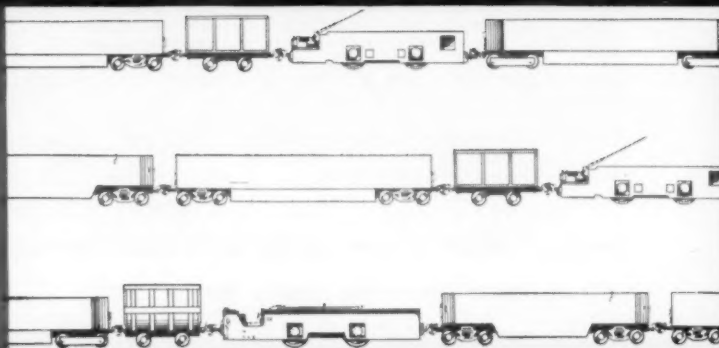
National Malleable and Steel Castings Company
of Canada, Ltd. • 128 Simcoe St. • Toronto 1, Ontario

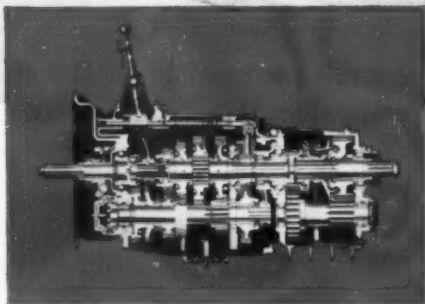


NACO
STEEL WHEELS



WILLSON
AUTOMATIC COUPLERS





Wells Overseas, Ltd., an associated company of Wells Cargo, Inc., Reno, Nevada, is using 16 KW-Dart 802-AT Tractors equipped with Fuller R-1160 ROADRANGER Transmissions in iron mining operations 250 miles south of Lima, Peru.

**Geared with
FULLER ROADRANGERS**

...91-TON LOADS with double bottoms...

Featuring 9-speed Fuller R-1160 ROADRANGER Transmissions, 16 KW-Dart 802-AT Tractors handle up to 91 tons of iron ore at a time on a mining operation in Peru.

Owned by Wells Overseas, Ltd., the 320 hp KW-Darts use the single-stick, semi-automatic ROADRANGERS to provide maximum performance on

the cross-country haul from crusher to the seaport of San Juan. Because the diesel engines can operate in the peak torque and hp range at all times, the 72-mile round trip is made in 3½ hours, including time for loading and unloading.

Ask about the Fuller Transmission designed to boost *your* profits.

STANDARD EQUIPMENT

on Fuller Off-Highway Transmissions

- COUNTERSHAFT INERTIA BRAKE . . . for quick, easy upshifts without double clutching . . . faster work cycles
- PRESSURE LUBRICATION and FILTRATION SYSTEM . . . for longer gear and bearing life . . . greater availability, less maintenance

FULLER

TRANSMISSION DIVISION
MANUFACTURING COMPANY

KALAMAZOO, MICHIGAN

Subsidiary EATON Manufacturing Company



Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla. Automotive Products Company, Ltd., Brock House, Langham Street, London W.1, England, European Representative

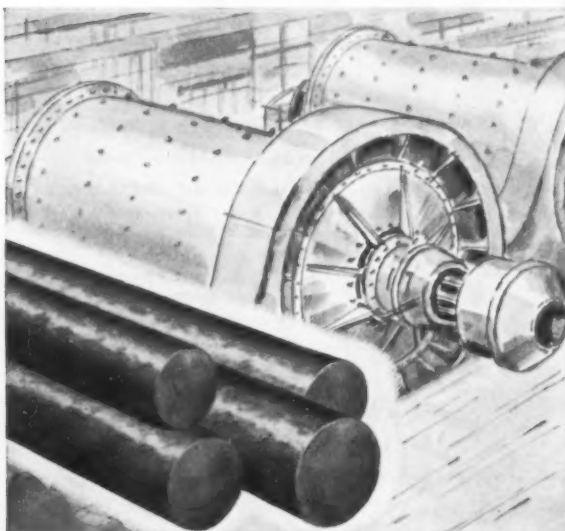


You get these **ADVANTAGES** with **CF&I MINING PRODUCTS**

CF&I offers the mining industry a wide range of steel products designed to help increase output while maintaining safe operations. This combination of economy and safety is another of the implications of the Image of CF&I.

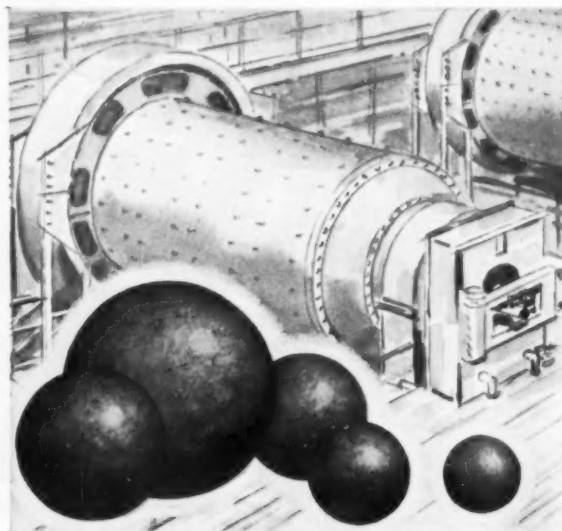
CF&I Mining Products are fabricated

from steels produced in CF&I's own mills. Every product is tested, controlled and inspected during each successive step of manufacture to meet and exceed the highest standards of the mining industry. In actual operation, each CF&I Mining Product provides the following advantages.



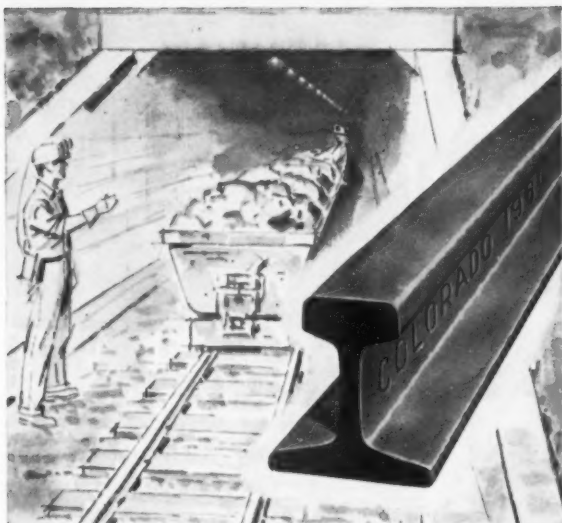
CF&I GRINDING RODS: Hot-rolled and machine-straightened from special analysis steels, in 1½" to 4" diameters (in ½" increments) and any length required.

ADVANTAGES: Maximum resistance to abrasion and bending. Extra-long service life.



CF&I GRINDING BALLS: Made from high carbon steels, chemically controlled to attain maximum hardness and toughness, in sizes ¾" to 5".

ADVANTAGES: Resist abrasion and withstand impact—grind more at lower cost.



CF&I MINE RAIL AND FASTENINGS: Rails available in weights from 12 to 45 pounds per yard. Fastenings include splice bars, angle bars, spikes, track bolts and nuts (square and hexagonal).

ADVANTAGE: Rails tailored to your individual requirements.



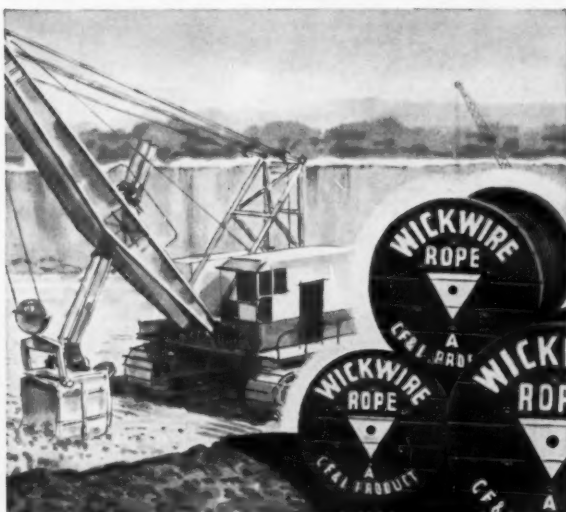
CF&I ROCK BOLTS AND REALOCK METALLIC FABRIC: Rock Bolts with Patten shells (left or right hand threaded) available in $\frac{5}{8}$ ", $\frac{3}{4}$ " and $\frac{7}{8}$ " sizes, from 24" to 120" long; also 1" slot and wedge type. Use with Realock Metallic Fabric.

ADVANTAGE: Achieve safe, economical, permanent ground support.



CF&I SPACE SCREENS: Your choice of metals, weaves, meshes and edge arrangements. For maximum volume or absolute screening accuracy, there's a CF&I Space Screen available.

ADVANTAGE: Space Screens that exceed your most exacting requirements.



CF&I-WICKWIRE WIRE ROPE: Where extra-high strength is required, order Double Gray Wire Rope, from extra-improved plow steel. Its breaking strength is 15% higher than the catalog breaking strength of improved plow steel ropes. Other Wickwire Ropes are available in all sizes, constructions and grades for every mining application.

ADVANTAGE: Wire ropes that make no bargain with safety.

For complete information on any CF&I Mining Product, contact your local CF&I sales office, or write for catalogs.

THE COLORADO FUEL AND IRON CORPORATION

In the West: THE COLORADO FUEL AND IRON CORPORATION — Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

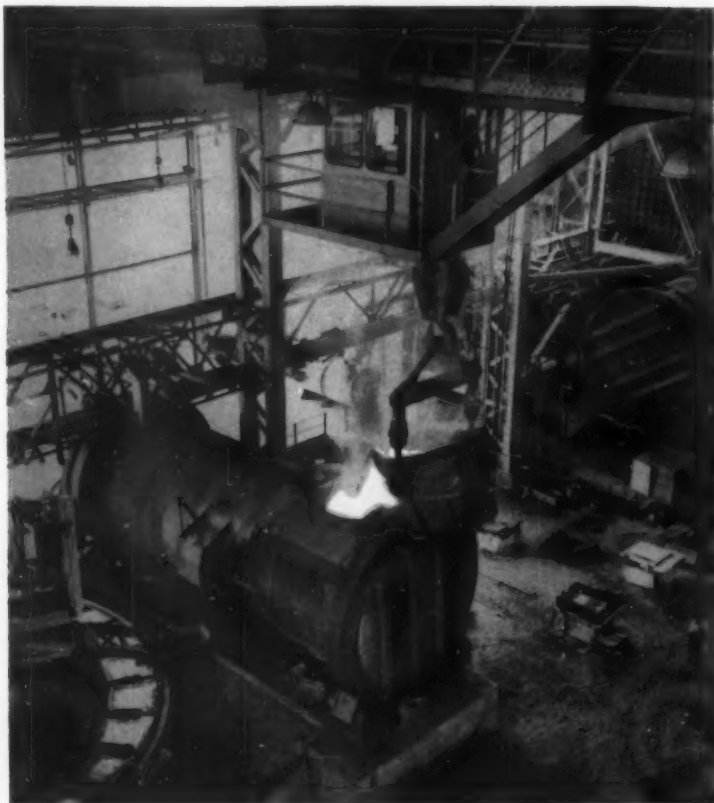
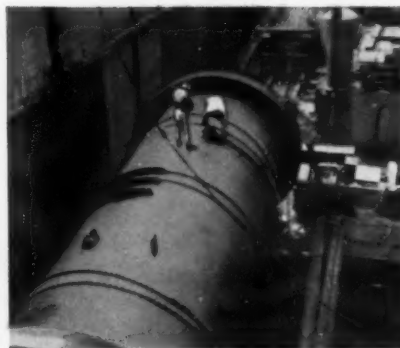
In the East: WICKWIRE SPENCER STEEL DIVISION — Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

CF&I OFFICE IN CANADA: Montreal



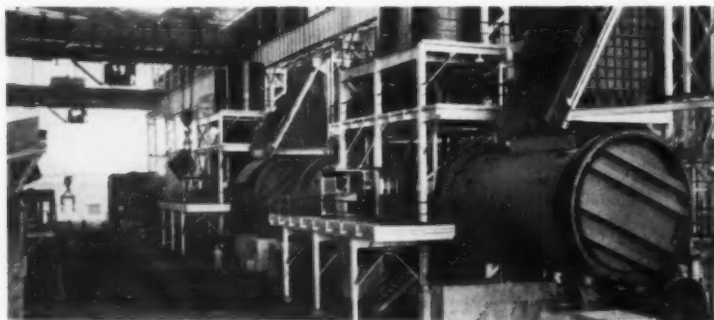
Workmen securing 83-ton holding furnace to ship's deck prior to sailing for Toquepala.

Huge holding furnaces and converters shipped in one piece to Toquepala



ABOVE: Treadwell holding furnace at work.

BELOW: The four Treadwell Peirce Smith type copper converters in service at Southern Peru Copper Corporation.



Other bids received by the Southern Peru Copper Company for these converters and holding furnaces specified shipment of the shells in sections, which would require costly assembling and welding in the field. Treadwell, with over a half century of experience in designing and building this type of equipment for the nonferrous industry, investigated load limitations of handling equipment and conditions at the erection site and submitted a quotation specifying shipment of these units in one piece.

There are two 13' x 36' holding furnaces — the world's largest — and four 13' x 30' converters in service at the new smelter.

The same Treadwell engineering experience is available to you — whether you need a single piece of equipment or a complete plant.

You can learn more about Treadwell equipment and engineering by writing for Bulletin No. 70. Send for a copy today.

M. H. TREADWELL COMPANY, INC.

140 Cedar Street, New York 6, N. Y.

1015 Farmers Bank Building, Pittsburgh 22, Pa.

208 So. LaSalle Street, Chicago 4, Ill.

TREADWELL

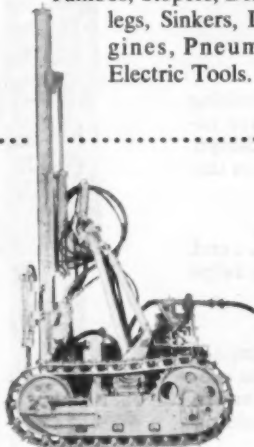
Nonferrous
Smelting and Refining
Equipment

TR-36

When you want to improve footage records
in anything from softest shales to hardest igneous rock
use **CP DRILLING EQUIPMENT**

Operators haven't found the formation that will stop CP Drilling Equipment. It's built for top footage records . . . all day, every day.

Mining operators find CP Drilling Equipment complete. In addition to the products shown, this high production equipment is also available: Hydraulic Boom Arms, Shaft Jumbos, Stoppers, Drifters, Air-legs, Sinkers, Diesel Engines, Pneumatic and Electric Tools.



REICHdrills

truck or crawler-mounted, provide Vari-Speed Hydraulic Top Drive and Feed that allows operator to adjust rotation and down-pressure to every type formation. Instant Safety Torque Release safeguards bit, stem and drive components. Hole sizes to 16"; down-pressures to 90,000 lbs.

CP 3-CONE AIR-BLAST BITS

give maximum footage for rotary deep hole drilling. Jet and standard models provide high-velocity hole cleaning action. There's a bit type for every formation, from very soft to extremely hard. Bit sizes from 5 5/8" to 12 1/4".

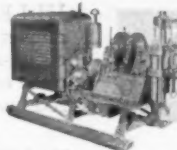


G-800 TRACDRIL

tows its own compressor over rough terrain, up steep grades. Sinks 3" holes to 75 feet with 4 1/2" bore Deep Hole Drills. Safety brakes are applied automatically the instant crawler throttles are released.

CP-15HD DIAMOND DRILL

provides high versatility for surface exploration. Skid-mounted, it moves from hole to hole under its own power. Bolted frame knocks down for transportation to remote sites. Furnished without skids for truck or jeep mounting. Capacity with EW-EX fittings - 2250 feet. Air or electric drives.



CP-65 AIR DRIVEN DIAMOND DRILL

is ideal for underground blast holes and coring. High torque 20 h.p. motor gives high drilling speed; greater capacity. Reversibility speeds up unscrewing of rod joints. Drill with built-in swivel head measures only 42 1/2" long... weighs just 200 pounds. Capacity to 600 feet.



CP "POWER VANE" ROTARY COMPRESSORS

are available in capacities from 125 to 900 cfm. You can't buy a more dependable air supply. Easy to start, they stay on the job 'til you say "stop." Smooth running and economical these CP Compressors are available with gasoline or diesel engine drive.



Chicago Pneumatic 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AIR-BLAST BITS

CATALOG, SURVEY & DIRECTORY NUMBER, 1960

233

Never before drill steel like this!

NEW GARDNER-DENVER **HI-LEED** STEEL

Drillers who have used this unique and revolutionary Gardner-Denver thread design are enthusiastic about its convenience and economy. Give it a try on your own rock drills—you'll soon see why. Call your Gardner-Denver drill steel specialist, or write for new bulletin on HI-LEED steel.

Only Gardner-Denver **HI-LEED** drill steel gives you all
these field-proved
advantages

ALWAYS UNCOUPLES
BY HAND

CUTS DRILLING TIME
ON EVERY HOLE

SENDS MORE IMPACT
TO THE BIT

DRILLS MORE FOOTAGE
PER ROD

PREVENTS LOST HOLES



New HI-LEED thread design makes wrenching unnecessary. Gardner-Denver engineers have incorporated field-proved reverse buttress design into an entirely new thread form that always uncouples by hand.

HI-LEED steel saves time in adding rod . . . and ease of uncoupling, without use of wrenches, helps drill hole faster.

HI-LEED sectional steel transmits drill impact almost as well as a solid rod. That's because precision-milled threads on rod and coupling are in close contact over a large total area, thus holding rod ends firmly together.

HI-LEED rods are designed to last longer than any other sectional steel, and the wide thread peak assures maximum wear. Carburizing and shot-peening give the steel a hard surface and tough inner core.

New HI-LEED design keeps mating parts snug—rods won't uncouple in the hole or while pulling out. Other thread forms may not hold a tight connection and many rod strings have been lost in the hole while pulling out with rotation on.



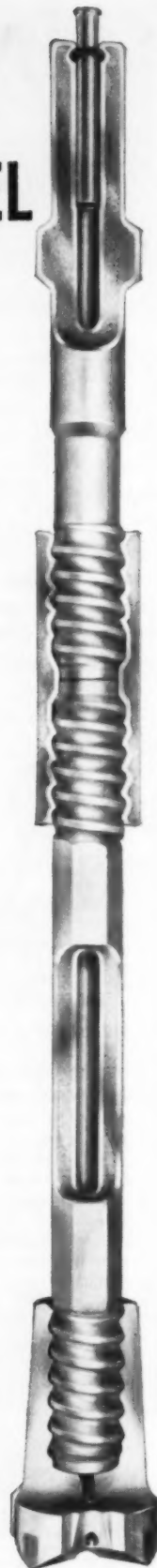
EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

International Division, 233 Broadway, New York 7, New York

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario



40 TO 400 MESH OUTPUT UPPED AS MUCH AS 300%



ENGINEERING AIR SEPARATORS TO SPECIFICATION

... comes naturally to Sturtevant engineers. They have a tradition of success in developing dry-processing equipment and plants for more than 75 years — from the first rock emery mills to the most modern fluid jet micron-grinding equipment. If your problems include any of the processes listed in the coupon, it will pay you to investigate.

WHAT CAN A STURTEVANT AIR SEPARATOR DO IN YOUR PULVERIZING SYSTEM?

In the cement industry, Sturtevant Air Separators have a tested record of increasing mill capacities from 25 to 300% while lowering power consumption as much as 50% — when used in closed circuit with grinding mills. Maybe they can do as well for you.

Easily adaptable to your materials. Sizes of Sturtevant Air Separators range from 3 to 18 feet in diameter. They deliver fines from 40 to 400

mesh at rates as high as 100 tons per hour.

Designed to cut costs! Sturtevant Air Separators are built for a lifetime of low-downtime service. Rugged construction plus easy accessibility for quick maintenance (typified by the "OPEN-DOOR" design in other Sturtevant equipment) assures more output per machine-year. Check the coupon for more information.

STURTEVANT

Dry Processing Equipment

The "OPEN-DOOR" to lower operating costs over more years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS

My dry-process materials are: _____
Desired capacity is: _____
Name _____ Title _____
Firm _____
Street _____
City _____ Zone _____ State _____

STURTEVANT MILL COMPANY, 157 Clayton Street, Boston 22, Mass.

Please send me your bulletin on Air Separators ☐

Also bulletins on machines for:

- | | | |
|--|--------------------------------------|--------------------------------------|
| <input type="checkbox"/> CRUSHING | <input type="checkbox"/> GRINDING | <input type="checkbox"/> PULVERIZING |
| <input type="checkbox"/> MICRON-GRINDING | <input type="checkbox"/> SEPARATING | <input type="checkbox"/> BLENDING |
| <input type="checkbox"/> SUPERFINE SELECTING | <input type="checkbox"/> GRANULATING | <input type="checkbox"/> CONVEYING |

PHONE: SCRANTON, PENNSYLVANIA

DIAMOND 4-8506

FOR

ALL

YOUR

DIAMOND

DRILLING NEEDS...

EQUIPMENT ... AND ...

CONTRACT DRILLING SERVICES



MACHINES

A complete line of core drilling machines ranging from the portable Super-Pioneer to the truck mounted 142-C. Rugged construction ... accurate machining ... constant technological progress assure you a modern drill with a long trouble free life, even under the most difficult operating conditions.

EQUIPMENT

Top quality raw materials ... constant quality control in manufacturing ... careful handling assure you of the best in rods, core barrels, casing and other core drill accessories. On standard items there is ample stock ready for fast delivery to you.

"ORIENTED" DIAMOND BITS

Four matrices ... three grades of diamonds ... seven ranges of stone size. Out of the many combinations possible, there is the right bit for your particular job. Give us all of the particulars and we will assist you in choosing the bit we believe best suited for your work.

CONTRACT DRILLING SERVICES

The most modern core drilling equipment ... highly trained drill crews ... expert supervision ... and the drilling "know-how" accumulated throughout our more than 77 years of experience are your assurance of a core drilling job well done.

When you think of diamond drilling ... equipment or contract services ... remember to phone Scranton—DIAMOND 4-8506.

SPRAGUE & HENWOOD, Inc.

SCRANTON 2, PA.

Member: Diamond Core Drill Manufacturers Association

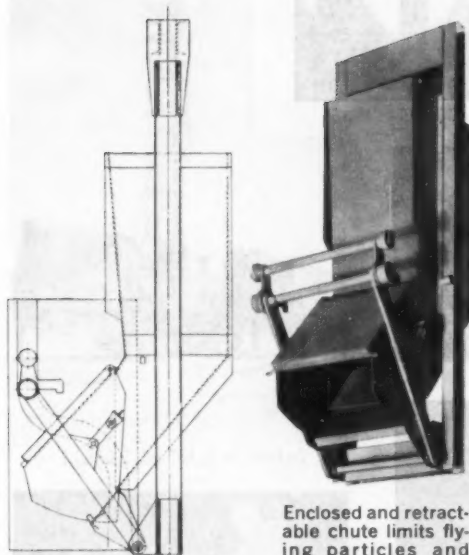


Branch offices: New York • Philadelphia • Pittsburgh • Atlanta • Grand Junction, Colorado • Buchans, Newfoundland

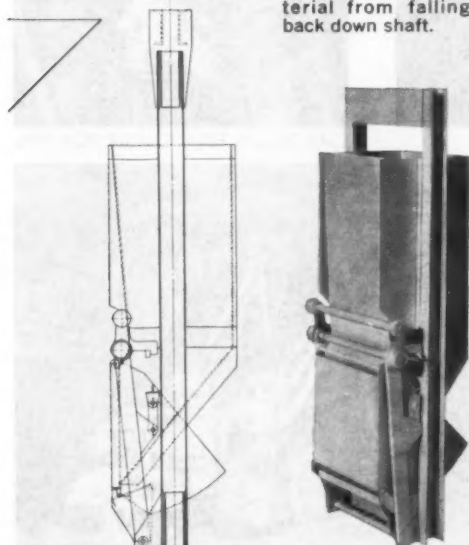
Export Division: Sprague & Henwood International Corporation, 11 W. 42nd St., New York, N.Y.

Door pivots from top in new front discharge skip

ACTIVATED BY TOGGLE LINKAGE SYSTEM



Enclosed and retractable chute limits flying particles and dust—prevents material from falling back down shaft.



In carrying position door is squeezed closed against rubber seal—locked in position—safety hook locks dump roller in position.

Lake Shore's new front discharge skip is similar in general construction to the Anaconda and other front dump skips. The unit differs in that the door pivots from the top and is actuated by a toggle linkage system that gives the same desirable door operating features as Lake Shore's famed "Jeto" Skip. The door is closed against the rubber seal by means of the toggle linkage and mechanically locked in position. This eliminates all possibilities of spillage and makes the skip completely water-tight. The main dump roller is locked in position by a safety hook actuated by another pair of rollers above the main dump rollers. This insures positive locking and complete protection against possible opening in the shaft.

An enclosed chute extension from the skip in the opened position, limits flying particles and dust problems during dumping. Also, a retractable chute extends over the bin during dumping, thus preventing material from falling back down the shaft. On average sizes the skip can dump within three feet vertical travel after the skip has entered the dump scrolls. This is possible because during the major portion of the door opening the pressure of the load against the door helps it to open.

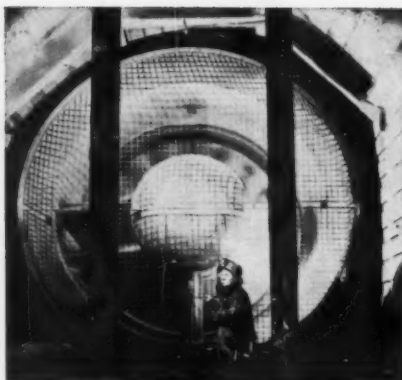
This latest development by Lake Shore provides the mining industry with a clean, fast dumping front dump skip that produces minimum reaction on the headframe while dumping.

LAKE SHORE, Inc.

IRON MOUNTAIN, MICHIGAN



SLUSHER IN MICHIGAN IRON MINE



AXIVANE FAN IN COLORADO METAL MINE

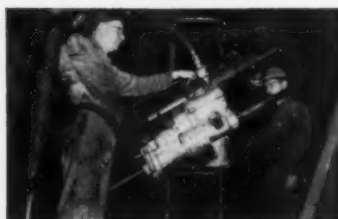


CHAMPION BLAST HOLE DRILLS



LOADER AND SHUTTLE CAR IN FRENCH IRON MINE

Speed Development...
Increase Production
WITH MODERN
JOY MINING EQUIPMENT



CORE DRILL IN PENNSYLVANIA IRON MINE



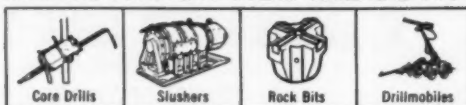
AIR LEG DRILLS IN CANADIAN URANIUM MINE



DRILLMOBILE IN MISSOURI LEAD MINE



EQUIPMENT FOR MINING...FOR ALL INDUSTRY



JOY

Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

In Canada: Joy Manufacturing Company
 (Canada) Limited, Galt, Ontario

THE W. S. TYLER COMPANY

3615 SUPERIOR AVENUE • CLEVELAND 14, OHIO

New York 17, N. Y.
750 Third Ave.

Pittsburgh 19, Pa.
530 Sixth Ave.

Chicago 2, Ill.
6 No. Michigan Ave.

Boston 16, Mass.
20 Providence St.

Philadelphia 7, Pa.
Philadelphia Natl. Bank Bldg.

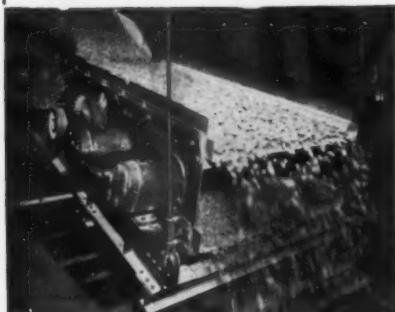
Atlanta 3, Ga.
Hurt Building

Dallas 1, Texas
Republic National Bank Bldg.

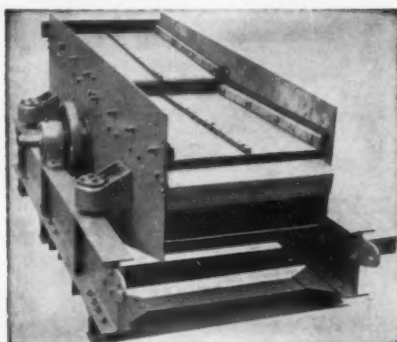
San Francisco 4, Calif.
Russ Bldg.

Los Angeles 5, Calif.
3540 Wilshire Blvd.

Canadian Plant & Office—St. Catharines, Ontario



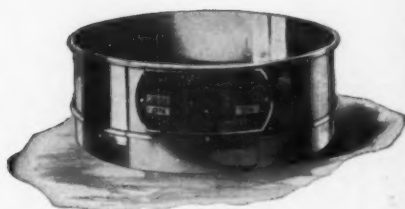
Ty-Rock Screen (Discharge chutes removed to show material)



Tyler-Niagara Screen



Hum-mer Screen



Tyler Standard Screen Scale Testing Sieve

WOVEN WIRE SCREENS

Supplied in all meshes and metals and for all purposes. Tyler Woven Wire Screen is noted for its accuracy and dependability. More than 7,000 specifications are manufactured, many of which are kept in stock ready for immediate shipment.

Write for Catalog 74, Specification Tables of Tyler Woven Wire Screens.

TY-ROCK SCREENS

This full-floating circle-throw screen combines immense capacity with low operating costs — especially for coarse and medium sizing. This is the ideal screen wherever huge tonnages of coal is handled and where flat or low angle screening is desired. Send for Catalogue 65.

TYLER-NIAGARA SCREENS

High-speed circle-throw screens for economical screening of coal products. Send for Catalogue 64.

TY-ELECTRIC HEATED SCREENS

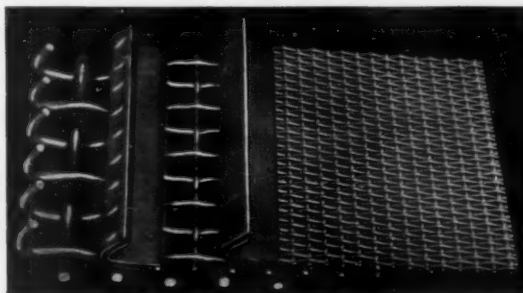
The Ty-Electric System of electric heating of Ty-Rock & Hum-mer Screens represents the most recent development in screening damp materials. The woven-wire screens are heated by passing electric current through the wires. Heat keeps the surface of the wire dry so that fine damp particles will not stick on the wires and blind the openings. Send us details of your damp screening problems so we can make recommendations.

TYLER HUM-MER SCREENS

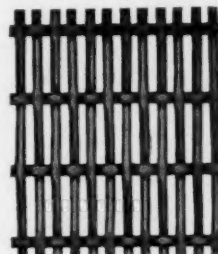
The Hum-mer was the first electrically vibrated screen and is still, by far, the lowest in operating cost for accurate sizing of medium and fine material. The Hum-mer employs less than one H.P. per vibrator and is furnished in one, two or three deck units in both open and closed models. Send for Catalogue 83.

TYLER TESTING SIEVES AND TESTING SIEVE SHAKERS

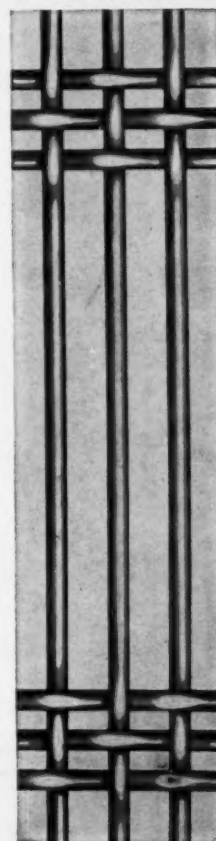
Tyler Standard Screen Scale Testing Sieves are the accepted standard for sieve testing throughout the world. The Ro-Tap Testing Sieve Shaker and the Ty-Lab Tester assure comparable, accurate data. Send for Catalogue 53.



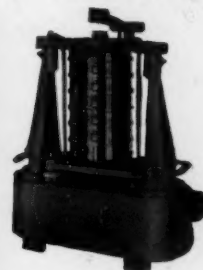
Tyler Hook-strip and bent edge for screen sections



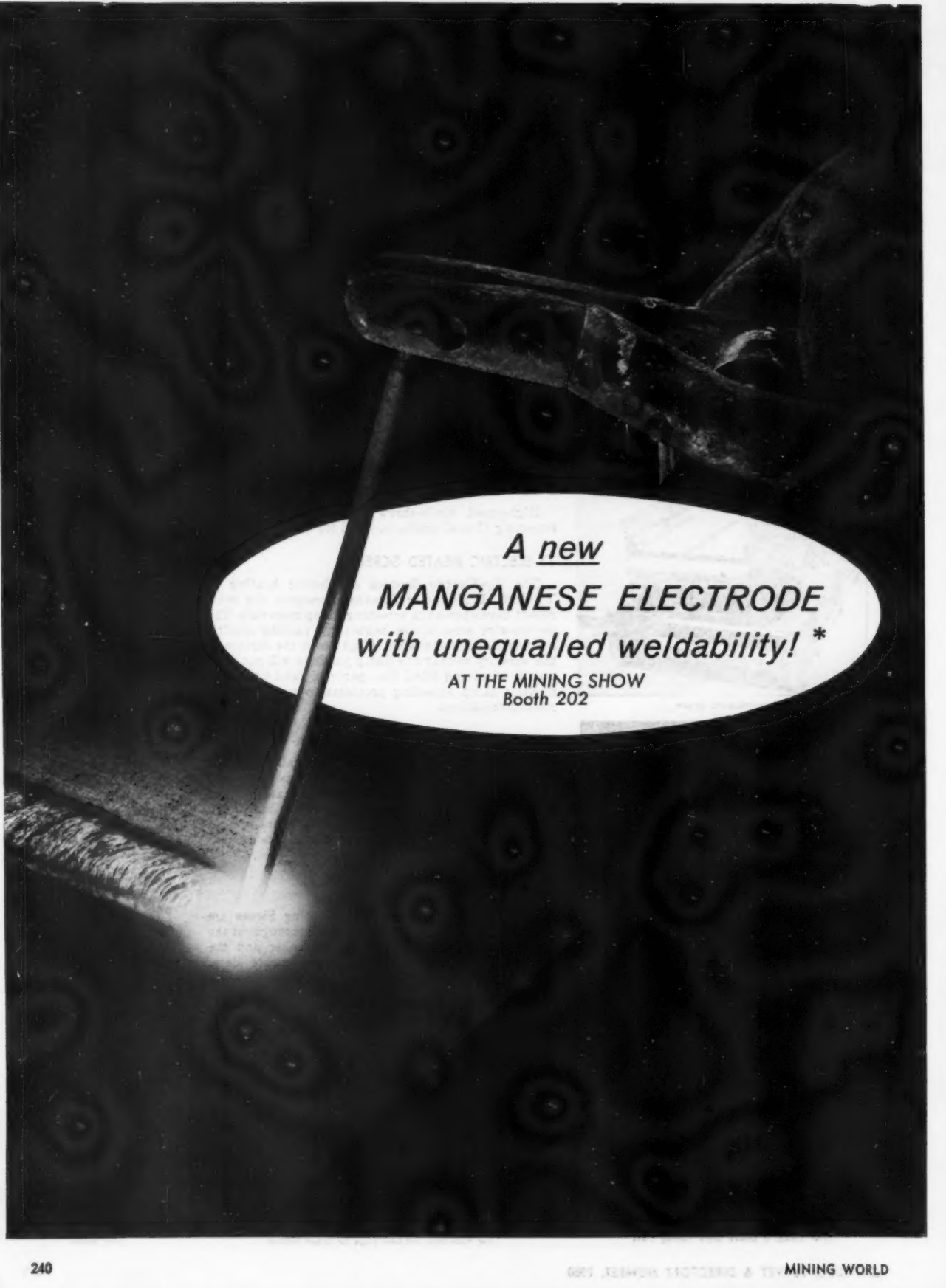
Tan-Cap Screen Cloth



Ty-Rod Screen Cloth



Ro-Tap
Testing Sieve Shaker with
Tyler Sieves

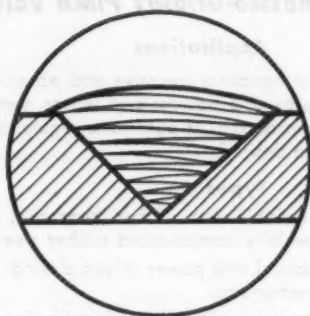


A new
MANGANESE ELECTRODE
*with unequalled weldability! **

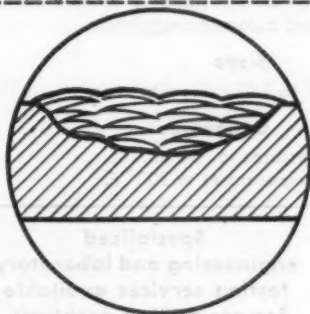
AT THE MINING SHOW
Booth 202

STOODY NICKEL MANGANESE

WITH IRON POWDER COATING



**FOR
JOINING**



**FOR
BUILD-UP!**

New Stooddy Nickel Manganese electrodes solve manganese welding problems in the field or in the shop! You'll find it unexcelled for joining manganese parts or building up worn areas on manganese equipment. Stooddy Manganese is now produced as a solid core wire on which the alloying elements in an iron powder coating are extruded. Unusual welding properties are obtained *with physicals unexcelled in the industry!*

Call your Stooddy Dealer—check the Yellow Pages of your phone book or write for list of dealers serving your area.

FEATURES:

Stable arc—No popping	Freedom from cracks
Easy re-strike	No porosity
Fast deposition	Easy slag removal
Low spatter	Clean deposits

Cores are uniformly straight and coatings perfectly concentric—insuring a stable, smooth running arc.

Ask your Stooddy Dealer for test samples...check speed and welding qualities, *test performance against every other manganese electrode you've ever used...* you'll find Stooddy Nickel Manganese provides something *new and needed* in the industry!

PHYSICAL PROPERTIES:

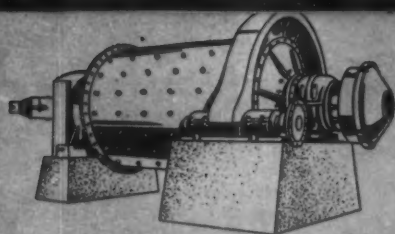
(Based on tests by independent laboratory)

	DC Straight Polarity	DC Reverse Polarity
Tensile Strength	119,000 psi	111,000 psi
Yield Strength	67,000 psi	66,000 psi
Elongation in 2"	55%	37.5%
Hardness—Single pass on manganese steel;		
as deposited—15 Rc, as work-hardened—48 Rc.		
Two passes on manganese steel;		
as deposited—18 Rc, as work-hardened—48 Rc.		

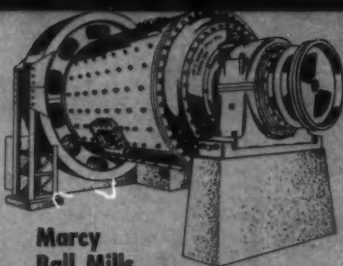
*Be sure that your Maintenance Superintendent and Welding Foreman see this announcement!

STOODY COMPANY

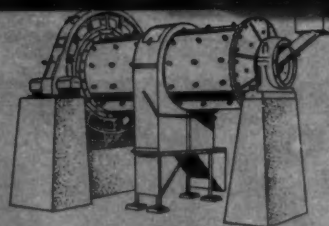
11932 East Slauson Avenue
Whittier, California



Marcy Rod Mills



Marcy Ball Mills



Marcy CPD Rod Mills

Proved and Improved ore-milling equipment by **MINE & SMELTER**

Marcy Grinding Mills

Applications

Grinding materials 1½" or finer to a product as fine as 325 mesh; materials such as metallic ores, industrial minerals, specification sands, cement, brick, lime, coke, clay, chemicals, fibrous materials.
Wet or dry grinding. Open or closed circuit.

Types

Grate discharge & overflow type ball mills.
Open end rod mills.
Center and end peripheral discharge rod mills.
Tube mills — Pebble mills
Acid-proof mills — Batch mills

Sizes

29 different diameter sizes, from 12" to 12'6" inside diameter.

Capacities

Up to 6650 tons per 24 hours per mill

Skinner Furnaces

Applications

Roasting molybdenum sulphide concentrates; roasting uranium-vanadium ores; drying uranium oxide precipitate; decomposition of oil sludge; lime burning; drying copper concentrates; roasting zinc ores; manganese reduction; dehydration of alunite; calcining of basic alum, lime sludges, clays, foundry sands, carbon, etc.; incineration of sewage.

Types

The Skinner is a cylindrical, multiple hearth type furnace, providing maximum flexibility, minimum dust losses, and the advantage of being able to handle sticky materials.
Gas, oil or coal fired.

Sizes

2 to 12 hearths
4'0" to 23'6" inside diameter
22 to 4000 sq. ft. hearth area

Massco-Grigsby Pinch Valves

Applications

For handling corrosive and abrasive pulps and liquids; and where remote control and/or automatic regulations are desired.

Types

Available with rubber, neoprene, or specially compounded rubber sleeves. Manual and power driven closing mechanisms.

Can be equipped for remote control and automatic regulation.

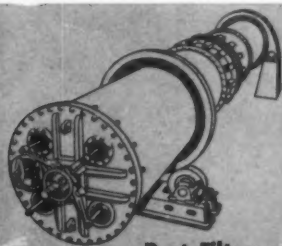
Sizes

1" to 14" inside diameter.

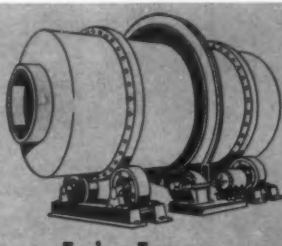
Capacities

Pressures to 150 psi.
Temperatures to 200° F.

Specialized engineering and laboratory testing services available for ore-milling problems.



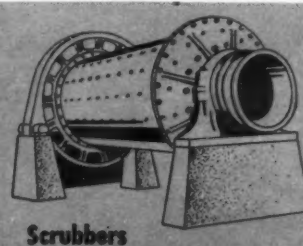
Burt Filters



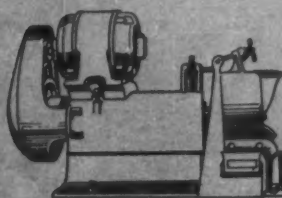
Fusion Furnaces



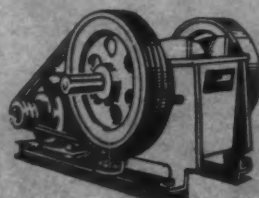
Leaching Drums



Scrubbers



Massco-McCool Pulverizer

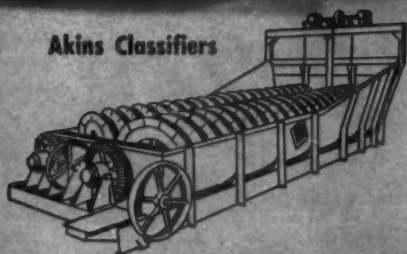


Massco Lab Jaw Crusher

Licensed Manufacturers and Sales Agents in Canada, Australia, Sweden, England and South Africa.

Sales Agents in Chile, Peru, Philippine Islands, Japan, New York City (for Continental Europe), and in the principal cities of the United States.

Akins Classifiers



Akins HMS Separators



Akins Densifiers



Akins Classifiers

Applications

Classification of solids by size and/or gravity.
 Dewatering.
 Washing ore, coal, oyster shell, sand and gravel.
 Desliming and deoiling phosphate rock and concentrate.

Types

Standard, simplex and duplex, for size separation, or dewatering, of coarse material.
 Submerged spiral, simplex or duplex, with large pool, for separation of finer sizes.
 Flared tank units provide maximum settling area and reduced overflow velocity.
 Special units for handling acid or caustic solutions and salt brines.
 Lifter bars and spray water box arrangements are available for difficult washing problems.

Sizes

12" to 84" spiral diameter, simplex and duplex.

Capacities

Sand raking capacity: up to 7860 tons per 24 hours (Duplex machine)
 Overflow capacity: up to 2386 tons per 24 hours (Duplex machine)

For Complete Information

...on these and other Proved and Improved Mine and Smelter products, write for catalogs.

Akins Heavy Media Separators

Applications

Any material that is amenable to heavy media separation of its components, such as coal, iron, manganese, fluorspar, chrome, lead-copper, tungsten, garnet, topaz, gravel.

Types

The two basic types of Akins Separators are modifications of the standard and submerged spiral Akins Classifiers.

Sizes

Spiral-diameter sizes from 12" to 84".

Capacities

Sink: up to 230 tons per hour.
 Float and middling: up to 290 tons per hour.

Akins Heavy Media Densifiers

Applications

Used for recovering and cleaning medium solids.

Types

The Akins Densifier is a modification of the submerged spiral Akins Classifier.

Sizes

Spiral-diameter sizes from 16" to 66".

Capacities

Raking capacities up to 49.5 tons per hour.

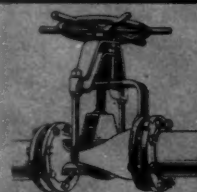
Esperanza Drag Classifiers



Skinner Roasters and Dryers



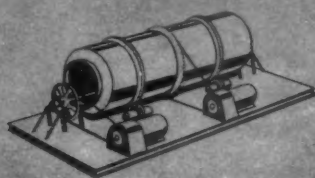
Wilfley Tables



Masco-Grigsby Rubber Pinch Valves



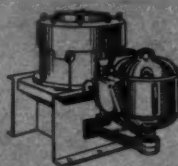
Marcy Pulp Density Scale



Pug Mills



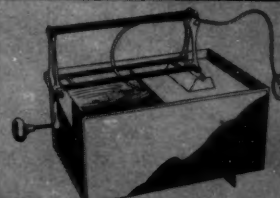
Vezin Sampler



Masco Gy-Roll Reduction Crusher



Lab Crushing Rolls



Masco-Adams Reagent Feeder

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that cares enough
to give you
the best!**

Manufacturing Division

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ALBUQUERQUE
701 HAINES N.W.

Clean, dry steam assured by cyclone steam separators.

Minimum ash impingement and positive cleaning with in-line tube arrangement.

Complete inspection and access provided by doors and lanceports.

Superheater slagging prevented by wide spaced slag screen platens.

Large gas inlet for low velocity and minimum slag carry-over.

High efficiency cleaning with retractable soot blowers.

Rapid gas cooling and slag chilling in large tangent tube furnace.

Easy draining steep slope hoppers.

Sticky slag discharge eliminated by side and rear wall water cooling.

These important design features assure trouble-free, continuous operation of this B&W Waste Heat Boiler

Empresa Nacional de Fundiciones, Paipote, Chile, uses this B&W Waste Heat Recovery Boiler to produce 42,500 lb steam per hour at 400 psig and 700 F at the superheater outlet.

HOW TO SOLVE WASTE HEAT BOILER PROBLEMS

B&W heat recovery system ends production bottleneck

A major problem in waste heat boiler operation is the fouling of steam generating surfaces by slag and ash from the process. Frequent outages and excessive labor for boiler cleaning add substantially to the cost of any plant operation. Production delays can result in further serious losses.

For example, the Empresa Nacional de Fundiciones copper smelter at Paipote, Chile was experiencing difficulty in handling high temperature corrosive gases with considerable slag and metallics carry-over. Slagging of boiler surfaces was severely limiting plant production. Unscheduled smelter shut-downs resulted in excessive refractory maintenance, high operating costs, and production losses.

B&W's engineers were asked to design a boiler to provide trouble-free operation for these difficult ash and slag conditions. An important requirement was that the new system be installed without interrupt-

ing plant operation. Utilizing the extensive experience gained from similar installations, B&W recommended a special, single pass, low draft loss boiler for the specific plant conditions at Paipote. B&W's recommendations for a completely engineered system were accepted and a waste heat boiler, flues, dust handling equipment, and auxiliaries were furnished.

The successful elimination of the waste heat handling problems, previously limiting production and causing high maintenance costs, has now been proved by several months of operation. In fact, plant production is now above design capacity.

B&W's extensive research and engineering facilities, plus its broad field experience in design and operating requirements in the metallurgical process industry, are available to solve your problems. The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.

Send for this Free Definitive
Bulletin — G-88 — Today



ME-100

B&W

THE BABCOCK & WILCOX COMPANY

BOILER DIVISION

**toughest
portable
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cables
made!**

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Where the going is rough, men who know mining have proven that General Cable's complete line of Super Service Portable Power Cables are built better to last longer than any other. From many years of field experience, General Cable has engineered each construction from conductor to jacket to stand up to the most rigorous service conditions. The Supertuf jacket is extra tough, extra tear resistant, exceptionally resistant to

abrasion and outstandingly resistant to oil, acid, water, flame and sunlight.

Stocks of Super Service cables are maintained at a General Cable distributing center handy to your location. The brochure showing the basic types and sizes may be obtained at any of the 65 General Cable Distributing Centers.





FLAT TWIN for use on shuttle cars, cutting machines, loaders, drilling units and other d-c equipment.



TYPES W and G for heavy-duty mobile equipment and d-c and a-c mining machines.



SH-D SHOVEL CABLE for high voltage supply with maximum safety to shovels, dredges, cranes and draglines.



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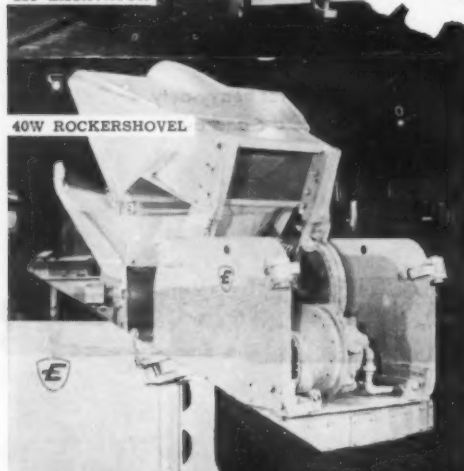
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and service
specify...

GENERAL CABLE

635 CONVEYOR - LOADER



125 EXCAVATOR



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40H ROCKERSHOVEL

630 EXCAVATOR



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..... on any underground loading and mining machine is your assurance of increased productivity and lower production costs.

This reputation didn't just happen. It was and is being earned. Earned by practical, advanced engineering. By superior rugged quality and craftsmanship by men who care. By service that doesn't end with delivery of your machine . . . but continues for all the long life of each piece of Eimco equipment and machinery . . . serving operators around the World.

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For Mining and Smelting Operations...

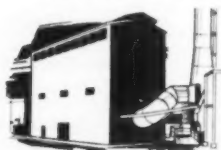
**WESTERN
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*Offers the Only Complete Line of
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**"COTTRELL"
ELECTRICAL
PRECIPITATORS**

▶ **WESTERN PRECIPITATION** is the organization that pioneered commercial application of the now-famous Cottrell process of *electrically precipitating* dust, fume, fly ash and other suspensions from gases. No other organization has had such extensive experience in this highly-technical field...no other offers such advanced developments and range of equipment...no other provides such unbiased recommendations on the type of installation best suited to *your particular requirements*. For further data write for "Cottrell" literature!



**"THERM-O-FLEX"
HI-TEMPERATURE
FILTER
SYSTEMS**

▶ **"THERM-O-FLEX" FILTER SYSTEMS** clean gases with inlet temperatures as hot as 600°F.—with virtually 100% collection. They use new type silicone-treated, woven glass filtering units that not only resist high temperatures but also are easily cleaned automatically by intermittent collapsing. No destructive vibration is required and there are no moving parts, nothing to require frequent service, maintenance or replacement. You save on both installation and operating costs. For further data write for "Therm-O-Flex" literature!

▶ **"DUALAIRE" REVERSE-JET FILTER SYSTEMS** are also available where high temperatures are not a factor. Continuous reverse-jet cleaning assures uniform operating efficiency. Write for descriptive "Dualaire" literature!



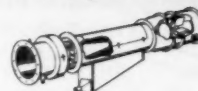
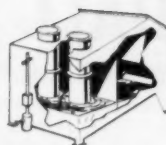
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DIVISION OF JOY MANUFACTURING COMPANY

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Cottrell Precipitators	Multiclone Dust Collectors	Therm-O-Flex Hi-Temp Filters	Dualaire Reverse-Jet Filters	Turbulaire-Doyle Scrubbers	Joy Microdyne Scrubbers	Combination Units	Holo-Flite Processors	Hi-Turbulent Heaters

**"TURBULAIRE-DOYLE"
and "JOY MICRODYNE"**

SCRUBBERS



▶ **"TURBULAIRE-DOYLE" SCRUBBERS** offer many important advantages where high efficiency, long life and maximum corrosion-resistance are essential in wet scrubbing types of applications. Unique *jet-action* scrubbing assures *unusually high collection efficiencies* without moving parts or frequent maintenance. Write for detailed "Turbulaire-Doyle" literature!

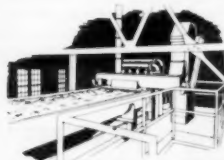
▶ **JOY MICRODYNE SCRUBBERS** combine unusual compactness, high operating efficiency and straight-thru "in-duct" design for new savings and economies on a wide range of applications. For further details write for descriptive "Joy Microdyne" literature!



**"MULTICLONE"
MECHANICAL
DUST COLLECTORS**

▶ **THE "MULTICLONE"** pioneered the modern principle of multiple, small-tube, high-efficiency centrifugal collectors—and is still unequalled in the field. Not only does it offer the higher separating efficiencies obtained by the greater centrifugal forces developed in multiple *small-diameter* tubes, but the "Multiclone" also is easier to service and maintain...is simpler to install because it requires no costly, complicated ducting...is far more compact...and offers many other important advantages that save money and boost efficiency on mechanical dust collection applications. For further data write for "Multiclone" literature!

...and for modern Heat-Exchange operations



**HOLO-FLITE
PROCESSORS**

▶ **"HOLO-FLITE" PROCESSORS** circulate heating or cooling fluid through the hollow shaft and blades of a conveyor screw, thus processing granulars, fluids or sludges as they flow along in *continuous* bulk flow. Far faster and more efficient than batch processing. "Holo-Flite" heats and dries with Hot Oil to 600°F...with Dowtherm to 750°F...with Steam to 150 PSI. Cooling range 1800°F. to 0°F. Multiple "Holo-Flite" tiers can be stacked for high capacities in minimum floor space. Many other cost-cutting advantages. Write for descriptive "Holo-Flite" literature!



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Goodall Rubber Company of Canada, Ltd., Toronto and Montreal

Distributors in Other Principal Cities.



"BROWN CORD"
AIR HOSE

Sizes 1/2" to 1", I.D.

A molded-and-braided hose for drilling, riveting, and other general pneumatic tool service. Tube, carcass and cover are combined to assure great strength and durability, without impairing flexibility and easy handling. Oilproof tube; rubber cover. Available in lengths up to 500 feet.



"SUBWAY" ®
AIR HOSE
"Standard of Quality"

Sizes 1/2" to 1 1/4", I.D.

Another Goodall "Standard of Quality" hose especially built for rock drilling and all other heavy-duty air tool work. Light weight, flexible, easy to handle. Tough, oil-proof black "Synplastic" tube; highest quality wrapped duck carcass; wear- and weather-resistant red rubber cover, with yellow criss-cross stripe. Maximum lengths of 50 feet.



"HARDROK" ®
WIRE BRAID
AIR HOSE
"Standard of Quality"

A super-hose for rock drills in construction, quarrying, mining and any other heavy-duty air service. Longwearing, oilproof "Synplastic" tube; horizontally braided steel wire carcass; tough yellow rubber cover, with black spiral stripe for identification. Light in weight, extremely flexible. Sizes 1/2" to 3", inclusive; two and three braid.



"NEWTYP"
SUCTION AND
DISCHARGE HOSE
"Standard of Quality"

Patented wire-reinforced, woven cord construction gives "Newtype" unusual strength and durability for both suction and discharge. Light weight, extremely flexible. Cannot kink, buckle or collapse, yet if accidentally crushed, can be quickly rounded into shape again without harm. Smooth bore. Sizes 1" to 4", I.D. Max. lengths of 50 feet. Black cover, green spiral stripe.



"BUCKSKIN"
WATER HOSE
"Standard of Quality"

Sizes 1/2" to 4", I.D.

Long famous for quality and reliability in every water hose service. Tube is of slow-aging rubber stock—tough and pliable. Strong rubber cover withstands roughest surface wear and abuse, and affords maximum protection to cotton duck carcass from contact with moisture. Maximum lengths of 50 feet.



"INFERNO" ®
STEAM HOSE

"Standard of Quality"

Sizes 1/2" to 2 1/2", I.D.

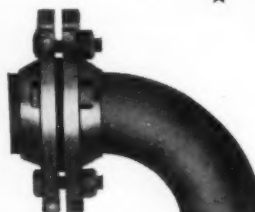
Built with multiple-layer wire braid carcass, heat-resistant tube and tough, abrasive-resistant red rubber cover with black spiral stripe for easy identification. Wire braids will cause steam to be diffused from damaged hose, providing a safety factor against sudden burst. Extremely flexible. Recommended for pressure up to 200 lbs., and temperatures up to 400°F. Maximum lengths of 50 feet.



"ALLSERV"
General Purpose
HOSE

For all types of pneumatic tools—also water, oil, chemicals, gasoline, paint spray, etc. A very flexible all-"Synplastic" molded-and-braided hose, in one, two or three braid construction, with tough wear-resistant red cover. Sizes 1/4" to 1 1/2", for working pressures from 200 lbs. to 300 lbs.

★ ★ ★



"KEMITE" DUCT
WITH
"FLANG-LOK"
Floating Flanges

For mine suction and discharge. Tube offers highest resistance to abrasive wear. Wire-reinforced carcass will not kink or collapse. Cover is tough, long-wearing rubber compound. Generally furnished with "Flang-Lok" Ends, to accommodate "Flang-Lok" Flanges. Sizes up to 4", I.D. "FLANG-LOK" FLANGES provide the most convenient and efficient method of connecting "Kemite" Duct, effecting a leakproof, rubber-to-rubber seal, and permitting full flow. For bolt alignment, flanges turn independently of the duct or pipe. No gaskets or washers. All sizes.

"GOODITE" FLEXIBLE PIPE. Same construction and advantages as "Kemite" Duct, above, but available in larger sizes—up to 12", I.D.

PLASTIC PIPE and FITTINGS

Goodall manufactures a complete line of Plastic Pipe—Polyethylene, A.B.S. and P.V.C.—to meet every requirement. All are produced under conditions assuring the highest degree of quality and uniformity. N.S.F. approved.

"POLYETHYLENE" (Flexible). Four brands, each with specific characteristics—"Long-Life," "Goodflex," "Super-Flex," "Lite-Flex" and "Spartan"—the latter for industrial services. All rated weights and sizes.

"A.B.S." (Semi-Rigid). Schedules 40 and 80; 100 lb. and 150 lb. job rated.

"P.V.C." (Rigid). Types 1 and 2.

Styrene and Nylon Fittings. Carefully made to provide accuracy and uniformity in threading, corrugations and dimensions. Complete range of styles and sizes.

The GOODALL Trademark on hose, belting, boots and clothing for the Mining Industry represents a standard of quality and reliability established through ninety years of manufacturing experience, backed by continuing research and development. Product specifications are based on first-hand knowledge of mine service requirements, with selected materials, expert craftsmanship and careful inspection assuring the utmost in on-the-job performance and economy.



CONVEYOR BELTING

"SUPER TRIPLE-S." Goodall's finest grade. Heavy duck carcass, high tensile rubber covers and strong friction between plies. Designed to carry run-o-mine coal, ores, slag and crushed limestone up to 10", wet or dry. Widths up to 48".

"TRIPLE-S." Same superior quality as "Super Triple-S," but of somewhat lighter construction. Widths up to 48".

"GOODALL." The right belt for the great number of lighter conveying jobs where the extra

qualities of "Super Triple-S" and "Triple-S" are not required. For sized coal, crushed stone, gravel, shells, ashes, etc. Widths up to 48".

ELEVATOR BELTING

"SUPER TRIPLE-S," "TRIPLE-S" and **"LA CROSSE"** are long-established Goodall brands, built to specifications that assure reliable, economical service under conditions for which each is designed. "La Crosse" made in widths up to 30", others to 48". Available with extra features—punching, stitching, endless—if desired.

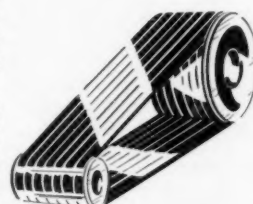


"POWER KING" TRANSMISSION BELTING

Friction surface, raw edge construction, especially built for most severe service. Minimum stretch and firm contact with pulleys at high speeds. Highest quality skim friction between plies. 35 oz. silver duck.

"POWER KING" High-Capacity V-BELTS

Built with larger, stronger, endless twin grommets to transmit greater H.P. This means fewer belts per drive, reduction in over-all weight, and less space required for any given load. The only high-capacity belts with so little stretch that the efficiency of the drive is not affected. Greater flexibility gives "Power-King" V-belts one-third more gripping power than other types... they pull heavier loads.



PUMP DIAPHRAGMS
PUMP VALVES
PISTON PACKING
ASBESTOS PACKING
RUBBER SHEET PACKING

RUBBER & DUCK PACKING
CHUTE LINING
EXPANSION JOINTS
FIRE HOSE
HOSE COUPLINGS, CLAMPS
LIQUID CORROSION-RESISTANT LININGS

GOODALL WATERPROOF FOOTWEAR and CLOTHING

Famous for Quality, Comfort and Long Wear

"TOE-SAVER"® BOOTS

Smooth, tough, flexible jet black rubber, heavy duck lined. Cushion insole. White cap over reinforced steel toe tested to withstand 2,000 lbs. pressure. Tire-tread soles. Hip, Style MB-346. Storm King, Style MB780. Short, Style MB946.

"WEAR KING"® BOOTS—Identical in quality with above, but without "Toe-Saver." Hip, Style MB345. Storm King, Style MB799. Short, Style MB945.

"RUBBERHIDE" SAFETY INNERSOLES. Sheet of high-tensile spring steel bonded between layer of top grade sole leather and layer of rubberized canvas duck. Puncture-proof.



MINER'S PACS Top quality black rubber Lace Pacs, Style ML-975, 16" high; Style ML-760, 15" high. Cushion insole. Cleated outsole. "Toe-Saver" Safety Toe. Also non-lace "Terra Haute" pacs, Style ML-271, in otherwise same construction. Other boots, workshoes, arctics and rubbers, built for extra wear and comfort.

COATS, JACKETS, OVERALLS

Items too numerous to describe here, in rubber, oiled and latex... all designed to afford maximum protection plus comfort in every kind of work. Style 338 coat is a long-time favorite... double back; corduroy-lined collar; length 49".

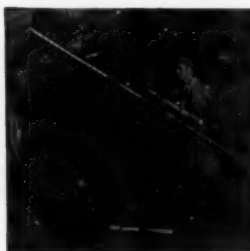
SAFETY HATS

"Hardboiled" Safety Hats in fibre glass and aluminum. Easiest to wear, yet providing maximum protection. Also, miners' caps, with or without lamp brackets.



TUNNEL SUITS

Style 80 jacket with Style 81 Overall makes the ideal suit for underground work. Other suit combinations to meet every preference or need.



Write for catalog describing the complete Goodall clothing and footwear line.

DIAMOND BITS

and CORE BARRELS

SERIES D-3 — Core Barrel*

This barrel is manufactured in EX, AX, BX, NX, and NC sizes. Available in 5 ft. and 10 ft. lengths it takes a core ranging in size from .840" dia. (EX) to 2.400" (NC). Incorporates new adjustable bearing assembly permitting vertical inner tube and bearing adjustments. Bearing suspended inner tube prevents core grinding and minimizes core erosion. This barrel is designed to recover maximum amount of core in all types of rock conditions. Tube borium hard faced strips on core barrel head retard abrasion, increase stabilization and extend core barrel life.

SERIES C-3 — Core Barrel*

Increased annulus between tubes and between outer tube and hole allows this barrel to be used with either water, mud or compressed air. Manufactured with heavier wall tubing than conventional barrels for that heavy duty coring job. Includes adjustable bearing assembly and tube borium hard faced strips on core barrel head. Available in standard 5, 10, 15 and 20 foot lengths.** Core sizes range from 1.067" dia. (AX) to 1.875" dia. (NX). Because of decreased core size we do not recommend this barrel for coring extremely hard rock.

3-1/2" x 2-1/8" Core Barrel*

This barrel is made for use with heavy duty drills. It can be used with water, mud or air and takes a 2-1/8" core. It is available in 5, 10, 15 or 20 ft. lengths. Illustrated is a detachable pilot-type core bit available for this barrel.

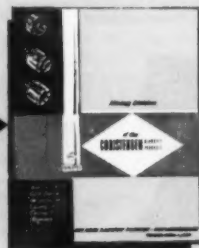


**Recommend AX in 5 and 10 ft. lengths only.

*Chrome plated inner tubes available for above barrels upon request.

Christensen manufactures many modifications and adaptations of the above equipment. For detailed information on our complete line of diamond bits and core barrels, write for catalog SD508.

Trouble-free operation — minimum maintenance — maximum core recovery. This is what you buy in Christensen core barrels. Barrels designed for every type operation and every size drill, from small prospector to heavy duty types.



FOR MINING

EXPLORATION



The pilot type core bit has proved a most efficient style for core recovery in soft formations and is currently being adapted to many of our core barrels. Tungsten carbide grit hard facing is available.



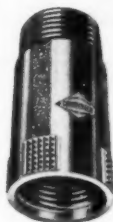
A step or pilot type non coring bit reduces vibration and increases penetration rate. It is ideal for drilling long straight holes, pilot holes, blast holes, grout holes, drain holes and cement in diamond drill holes.



The casing shoe has box thread (pin thread available), extra hard matrix and 25 per carat size diamonds. Casing shoes are set without inside gage stones to allow a corresponding size bit and reaming shell to pass.



Here is a standard bevel wall impregnated core bit with light diamond concentration. It is designed to overcome the problems of hard, fractured, abrasive and, in general, difficult to core rock. There is no salvage or credit value for returned bits of this type.



New balanced type reaming shell, designed and perfected by Christensen, utilizes an extra hard matrix metal that increases shell life over that of the insert type shells. There is a slight additional charge for hard facing.



The casing bit has box thread (pin thread available) and extra hard matrix. It is used for collaring holes and for reaming a hole for casing.

"Less cost per foot"

Rock differs in drillability from area to area. Christensen will custom design your bits to insure you of drilling at "Less Cost Per Foot." Contact Christensen today.

Mining Division of the

CHRISTENSEN DIAMOND PRODUCTS

MAIN OFFICE AND PLANT 1937 SOUTH 2nd WEST
P. O. BOX 387 SALT LAKE CITY, UTAH



in uranium ore processing...

TRONA[®] SODIUM CHLORATE

out-performs other oxidizing agents
because of higher oxidizing power,
economy and ease of handling

Experience proves that TRONA SODIUM CHLORATE is the best oxidizing agent you can use in the acid-leach process for recovering uranium values from its ores. NaClO_3 is more economical, too, because of its higher oxidizing power. It is rapidly and completely soluble; in the leaching circuit it forms a solution, not a suspension. Another advantage—Trona sodium chlorate shipping drums are suitable for re-use in shipping yellow cake. AP&CC, the largest domestic producer of sodium chlorate, has the knowledge, experience and facilities to produce a consistently better sodium chlorate for your milling operations.

TRONA[®] SODA ASH is used in acid and alkaline processes for the refining of uranium ores and as a pH modifier in the ore milling circuit. High quality Trona soda ash has applications also in the refining of lead dross and as an extractant of nonferrous minerals from low percentage ores by flotation.

*Write for NaClO_3 facilities, technical data and applications bulletin. Also available
—an attractive and functional wall chart for chlorate handling precautions.*



American Potash & Chemical Corporation

3000 WEST SIXTH STREET, LOS ANGELES 54, CALIFORNIA
99 PARK AVENUE, NEW YORK 16, NEW YORK

Sales Offices: LOS ANGELES, NEW YORK, CHICAGO, SAN FRANCISCO, PORTLAND (ORE.), ATLANTA, COLUMBUS (O.), SHREVEPORT

Producers of: BORAX • POTASH • SODA ASH • SALT CAKE • LITHIUM • BROMINE • CHLORATES • PERCHLORATES • THORIUM
YTTRIUM • RARE EARTHS • and other diversified chemicals for Industry and Agriculture

Simplex PRODUCTS GUIDE

SIMPLEX WIRE & CABLE CO., CAMBRIDGE 39, MASSACHUSETTS, U. S. A.



Simplex ANHYDREX Insulated Cables for Power transmission and Communication (like the Simplex TIREX Portable Cords and Cables shown in adjacent column), though manufactured as stock products, are custom designed to suit all service requirements. A large technical and engineering staff at Simplex' main plant is equipped to give you the benefits of their long experience in electrical cable planning.



ANHYDROPRENE — Simplex ANHYDROPRENE Cables are designed for economical installation in ducts, conduits, racks, trays and raceways. Stock sizes AWG 14 to 1000 MCM are recommended for 90 C service in WET or DRY locations. The words "Simplex ANHYDROPRENE" are either printed or molded plainly on the jackets of all ANHYDROPRENE cables. This marking signifies the traditionally high quality of a Simplex product.

CATALOGUE #1028



ANHYDREX-NEOPRENE — Simplex ANHYDREX-NEOPRENE Cables have the added mechanical protection of a heavy wall of neoprene jacketing. These cables are manufactured for use in aerial installations and for direct burial service. Stock sizes AWG 14 to 1000 MCM are recommended for 90 C service in WET or DRY locations.

CATALOGUE #1028



ANHYDREX-PLASTEX — Simplex ANHYDREX-PLASTEX (ANHYDREX-insulated, PLASTEX-jacketed) Cables are scientifically designed for compatibility between insulation and jacket, and for perfectly balanced performance in ducts, conduits, aerial and direct burial installations. ANHYDREX-PLASTEX Cables are recommended for service in a number of environments but especially where oils and chemicals are a problem.

CATALOGUE #1028



ANHYDREX Insulated Control Cables — Simplex ANHYDREX Control, Signal and Communication Cables have an additional thickness of appropriately coded neoprene over each individual conductor, plus heavy-duty neoprene jackets. ANHYDREX insulation provides excellent signal reproduction and is exceptionally stable, even when operating with high ambient temperatures.

CATALOGUE #1028



ANHYDREX XX — Simplex ANHYDREX XX is a butyl-based insulation of the highest possible quality. Because of its exceptional resistance to heat and ozone, it has general applications in circuits operating up to 35,000 volts, with permissible conductor temperatures of 90 C. to 5KV, and 85 C to 17KV — in wet or dry locations.

CATALOGUE #1023



CONDEX — Simplex CONDEX Cables are protected against mechanical damage by interlocked metallic armor. The armor is manufactured of galvanized steel, plain or baked enameled (colored) aluminum, bronze or other metals, and can be applied over any cable core within a very wide diameter range. CONDEX Cables may be further protected by a thermoplastic covering over or under the metallic armor.

CATALOGUE #1024



TIREX SO and SJO Cords — TIREX SO and SJO Cords are constructed to meet the most rigid specifications. All of their special features are carefully selected and processed to give maximum qualifications for portable service. They will twist without kinking, and bend without breaking. TIREX stranding affords maximum flexibility without sacrificing strength.

Conductor temperature rating 75c

CATALOGUE #992



TIREX Low Voltage Portable Cables — TIREX Low Voltage Cables are individually designed for specific applications. They are practically indestructible when used to do the work for which they are intended.

Conductor temperature rating 75c

CATALOGUES #992 & #1011



TIREX High Voltage Portable Cables — TIREX High Voltage Portable Cables have unequalled strength and versatility. Designed primarily to transmit energy to mobile electrical equipment, they are also used as temporary power lines during alterations or emergency repairs.

Conductor temperature rating 75c

CATALOGUE #1012



TIREX Mine Locomotive Cables — TIREX Mine Locomotive Cables — both single and two-conductor concentric — are approved by the Bureau of Mines and have the raised marking "P-101 BM" on their heavy-duty neoprene jackets. All TIREX Cables are cured and conditioned for service in lead.

Conductor temperature rating 75c

CATALOGUE #1011



TIREX Mining Machine and Shuttle Car Cables — TIREX Mining Machine and Shuttle Car Cables are designed for stability under today's rigorous mining conditions. The insulated conductors are "ribbed" or gear-shaped. This feature causes them to interlock with the heavy duty neoprene jacket and prevents them from slipping. Both Type W and Type G have "P-101 BM" molded onto the jacket.

Conductor temperature rating 75c

CATALOGUE #1011



TIREX Dredge and Shovel Cables — TIREX Dredge and Shovel Cables are masterpieces of engineering achievement. Every consideration has been given to safety and durability. Simplex special cured-in-lead neoprene armor effectively resists all the elements normally encountered in this type of work.

Conductor temperature rating 75c

CATALOGUE #1012



TIREX Welding Cables — TIREX Welding Cables are scientifically stranded for maximum flexibility without wrist drag. Cured-in-lead neoprene jackets provide utmost safety for both operator and bystanders.

Conductor temperature rating 75c

CATALOGUE #1011

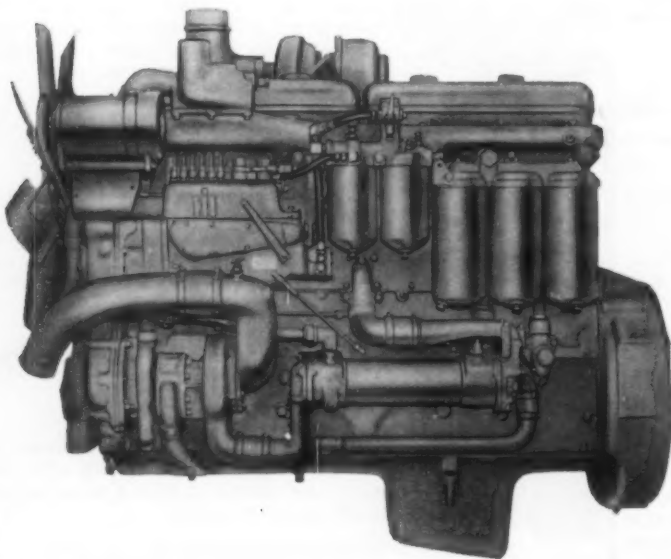
How **BRAWN-BACKED** **Payscraper®** features give you stepped up...loading

From power plant to push-block, the 34-cu. yd. International 295 Payscraper gives you an exclusive combination of features that step up dirt-on-fill delivery! Compare quiet, big-capacity DT-817 Payscraper power. Try the advantage of up or down, on-the-go, Payscraper power-shifting that provides load-speeding *automatic* direct-drive lock-ups in second, third, and fourth gears! Measure *extra value features* like safe, effortless power-steering—that leaves “the steering feel in the steering wheel!” Note how exclusive torque-cushioning planetary drive axles add dependability to rough-and-tumble earthmoving! See how 122-inch bowl width speeds loading and unloading—adds control ease and stability, loaded or empty. Prove on your job that bonus performance “rides” the Payscraper bowl. Choose the 2-axle “295”; or 3-axle, 34-cu. yd. “495.” See your International Construction Equipment Distributor for a demonstration.

...roading

Payscraper power-to-payload punch tops all other rubber-tired rigs—because the fast-slugging, high-torque International DT-817 diesel is the Payscraper power plant! The 375-hp, turbocharged DT-817 gives you direct, push-button starting; all-altitude high-efficiency performance; power for top rim-pull to help speed all steps of the cycle; time-saving “no-lag” control power!

...dirt-on-fill
capacity!





Even "dead" sand comes alive and "boils" fast into the Payscraper bowl. Every detail of Payscraper design aims at speeding the cycle, and staying available! The 21-inch diameter steel cross tube provides super load-bearing strength and resistance to impact. Bowl "back-bone," draft arms and side reinforcing members all are massive high-strength box-section steel weldments. "X"-member reinforcing maintains perfect push-frame alignment at all times. And the 4-speed, planetary-type, torque-converter power-shift transmission automatically adjusts torque and load to speed — to maintain full capacity!



You steer the 140,000-lb. loaded Payscraper almost as easily as a 3,600-lb. automobile! Payscraper gives the big control advantages of (1) exclusive International rack-and-pinion plus tandem pump steering system; and (2) 3-degree forward spindle pitch that improves scraper balance and prevents "nose downs" in high-speed turns. The 16-adjustment, bump-smothering seat builds operator confidence, too. And reach-easy power brakes, "control tower" vision, and flush deck safety help him deliver full Payscraper capacity, and take advantage of speeds up to 33.5 mph. He commands ample power and traction to pull directly out of 90-degree turns, even on soft fills!



The fast, positive-acting Payscraper ejector mechanism is powered by the International PTO-driven Cable Control Unit. One cable drum of this simple planetary system actuates the apron and ejector; the other drum positions the bowl to control spreading action. Apron lifts to a big 94-inch opening. Two ejector-plate pushing members apply dozer-like action to force out the whole 34-cu. yd. load cleanly. Action of six heavy-duty springs, stretched during ejection, positively powers the ejection mechanism's return!



Here's your 76-page cost and production estimating book—newest, most authentic and complete guide for estimating material-moving costs—and for selecting equipment combinations for top profits, anywhere! Yours for the asking from your International Construction Equipment Distributor!

International
Harvester Co.,
180 N. Michigan Ave.
Chicago 1, Illinois
A Complete
Power Package



International[®]
Construction
Equipment

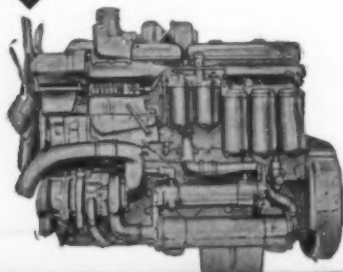
Power-steer and power-shift

**with TD-25 standard equipment
...for full-load turns
...full-speed cycles!**



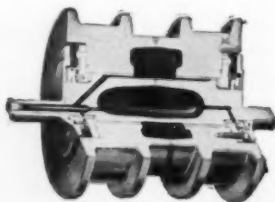
▲ **Keep big rock loads** on the move full time, with exclusive Planet Power-steering. Full power on both tracks, full time is the answer! And Hi-Lo, on-the-go power-shifting lets you match power to condition, instantly, and keep the yard-boosting advantage of uninterrupted momentum!

Big power "plus" of the new TD-25 is the new direct-start, turbocharged 6-cylinder International DT-817 diesel engine. This versatile engine also powers International Payscraper®, Paywagon®, and rear-dump Payhauler® models—plus the TD-25. Equipment-spread power standardization simplifies your servicing and parts-stocking.



Cleaning the face of a Missouri strip mine behind a big dragline, this TD-25 shoves "tractor-sized" boulders aside with the greatest of ease. The "25" also builds dragline walkways and haul roads; pushes loaded trucks; and drastically cuts the cost of clearing new stripping areas.

Thickest-shelled roller design in the crawler industry—with king-size lube reservoirs and seal-protecting pressure-relief passages—let you power-lubricate without affecting seal life or efficiency. These are Dura-Rollers—the track rollers that make 1,000-hr lube intervals practical!



No attachment! No after-thought! No stop-gap!

Years'-proven Planet Power-steering and Hi-Lo power-shifting are *designed-in, built-in*, basic standard equipment of the new 230-hp International TD-25.

With "live-track" Planet Power steering, you get full-load king-size crawler efficiency on turns, as well as straight-aways. And Hi-Lo power-shifting gives you on-the-go matching of power to load to give you big, cycle-speeding advantages!

International Planet Power-steering eliminates load-limiting "dead-track" drag. And Hi-Lo power-shifting does away with time-wasting "gear-shift lag." No wonder the new TD-25 can outearn king-sized clutch-steered crawlers up to 50%—on tough high-walling; overburden removal; and many other coal, mineral, or building-material mining jobs!

Big-capacity track-and-engine teamwork

New TD-25 7-roller tracks are strength-matched to team with the full effort of the New 230 hp diesel engine. The "25" is platformed on super-rugged double-box-beam frames—and carried smoothly on International's new minimum-maintenance Dura-Rollers!

Press the direct-start button, to command the "25's"

free-breathing diesel horsepower. Dual valving of the "25's" high-torque DT-817 engine provides for peak turbocharging efficiency—to deliver full-rated performance from sea level to timberline!

Full TD-25 performance is at your fingertips, full time!

Power-shift and power-steer the new "25" with king-sized loads—around curves, upgrade, anywhere. Compare years-proven simplified International planetary design that's engineered and located to break the load-limiting, time-losing steering and shifting bottlenecks which plague king-sized clutch-steered crawlers. Measure all the "25's" standard equipment extra value features. Let your International Construction Equipment Distributor demonstrate!



International[®] Construction Equipment

International Harvester Co., 180 N. Michigan Ave.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers and Bottom-Dump Wagons... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.



A Constant Standard of Quality in

EVERYTHING YOU NEED FOR DRILLING ROCK



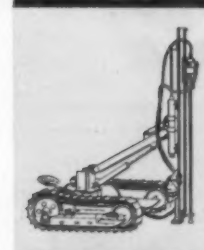
DRILLMASTERS

The most productive and versatile primary blast-hole drill ever developed. Completely self-powered and self-propelled. For rotary drilling or percussion drilling with the revolutionary I-R Downhole drill.



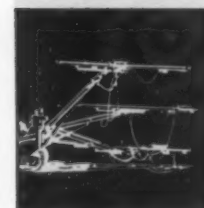
QUARRYMASTERS

The big blast-hole drilling rig for heavy-duty service in mines or quarries. Completely self-powered and self-propelled. Can be used as a percussion drill or rotary drill simply by interchanging drill units.



CRAWL-I-R DRILLS

The most rugged and completely mechanized crawler drill obtainable. All drill-tower motions hydraulically controlled, converting setup time into drilling time. Tows its own portable air compressor.



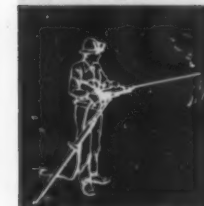
HYDRA-BOOM DRILLING RIGS

Mechanized rock drilling at its rugged best. Heavy-duty hydraulic booms and power-feed drifters for tractor, truck or jumbo mounting. Save manpower—increase production—cut drilling costs.



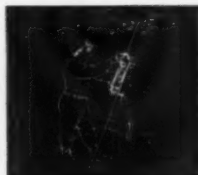
WAGON DRILLS

Versatile and powerful wheeled units, manually adjustable for drilling in any position. Heavy-duty FM-4 Wagon Drill and light-weight JHM Wagonjack.



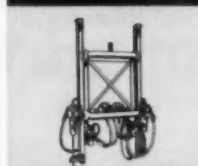
UNIVERSAL JACKDRILLS

The first completely integrated Jackleg drill ever developed. Telescopic feed leg gives full 6-foot feed from an easily-handled 3-foot leg. Five-position throttle and roll-type feed leg valve simplify operation.



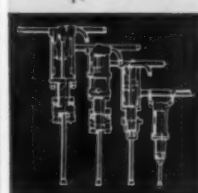
VACUJET STOPERS

The dustless I-R stopper drill with built-in jet suction and pressure discharge for fast, clean roof bolting jobs. Only a canvas bag dust collector needed. Use with I-R carset bits and I-R carburized drill steel.



DUAL-DRILL RIGS

Suspended from a side boom tractor, the Dual Drill Rig drills two holes at a time in any trench pattern. Rugged framework mounts dual heavy-duty drifters with long feed. Ideal for pipeline and trench drilling.



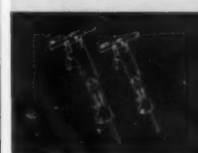
JACKHAMMERS

A complete line of hand-held percussion drills. A size, weight and drilling power to meet the specific requirements of any job to best advantage. Known the world over for stamina and dependability.



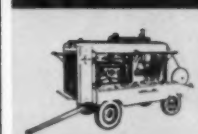
CARSET BITS

The tungsten-carbide insert bit pioneered and perfected by Ingersoll-Rand. High sustained drilling speed in any type of ground. Shoulder drive, bottom drive or tapered socket bits in sizes from 1 1/4" to 4". Downhole-drill bits from 4 3/4" to 9".



PAVING BREAKERS

The most complete line of demolition and digging tools available. Six basic sizes, from heavy-duty R-30 slag breaker to lightweight J-10 utility tool. Also a complete line of precision made accessories.



AIR COMPRESSORS

From the world's largest manufacturer of Compressors;—Gyro-Flo portable air compressors from 85 cfm to 900 cfm—Stationary air compressors from 1 hp to 6000 hp.



AIR-LINE LUBRICATORS

Assure proper lubrication for longer life and reduced maintenance of all air-powered rock drills and paving breakers. Operate in any position—automatically feed right amount of atomized oil into air line.



BIT AND ROD SHOP EQUIPMENT

Bit grinders, shank grinders, steel cutters, steel sharpeners and bit and rod furnaces, designed and built by rock drill experts. Everything you need for a well-equipped bit and rod shop.

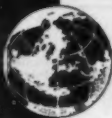
Your I-R representative is a skilled specialist with wide experience in every phase of rock drilling. Call him whenever you want assistance or advice.



Ingersoll-Rand

5-949 11 Broadway, New York 4, N. Y.

A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR ROCK DRILLING



1960 Catalog Index of Equipment and Manufacturers

The CATALOG INDEX is comprised of two sections:

SECTION I is an alphabetical listing of the specialized products and equipment used by the MINE-MILL-SMELTER industry. All principal manufacturers of these products and equipment are listed for your convenience.

SECTION II is an alphabetical list of all principal manufacturers **AND THEIR ADDRESSES**.

The names of manufacturers who are represented in

this issue by catalogs or advertisements are printed in **BOLDFACE** type in Sections I and II. The page numbers of their catalogs or advertisements are also given in Section II.

Every effort has been made to make your MINING WORLD-WORLD MINING CATALOG ISSUE, Development and Directory Number as complete and accurate as possible. MINING WORLD, however, cannot be responsible for changes in names, addresses, and other discrepancies.

SECTION I

Equipment Index

SECTION I contains an alphabetical list of product and equipment names. Wherever feasible, equipment has been indexed under headings representing the nomenclature preferred by the industry; or in many cases under the principal proper noun. For example,

"Flotation Machines" are indexed as such rather than under the all-encompassing heading "Machines." Rock Drills, however, have been most logically listed as "Drills, Rock." European terms have been retained where applicable and understandable.

ACETYLENE

See Welding Equipment

ACID

See Reagents and Chemicals

ACTUATORS

See Cylinders and Actuators

AERIAL SURVEYING

See Exploration Services

AGGLOMERATING EQUIPMENT

See Pelletizers and Nodulizers

AGITATORS AND CONDITIONERS

American M.A.N. Corp.
Baker Perkins Ltd.
Bethlehem Steel
Booth Co., Inc., The
Davison & Co. (Hexham) Ltd.
DENVER EQUIPMENT CO.
DENVER SUPER-SEE DENVER
EQUIPMENT CO.
DIESEL ENERGY CORP.—SEE
KLOCKNER-HUMBOLDT-
DEUTZ, A. G.
DORR-OLIVER INC.
Dravo Corp.
EIMCO CORP.
Galigher Co.

GENERAL ELECTRIC CO., LTD., THE

HARDINGE CO., INC.
Hirsch Bros. Machine Co., Inc.
Inflico, Inc.
INTERNATIONAL B. F. GOOD-
RICH CORP.
Kennedy-Van Suan Mfg. & Eng.
Corp.
KLOCKNER-HUMBOLDT-
DEUTZ, A. G.
Knapp & Bates Ltd.
Miners Foundry & Mfg. Co.
Minerals et Metaux
Mixing Equipment Co.
Morse Bros. Machinery Co.
National Tank & Pipe Co.
Philadelphia Gear Works, Inc.
SANTA FE TANK DIV., FLUOR
PRODUCTS CO.
SMITH & CO., F. L.
Standard Elec. Mfg. Co., Inc.
TELLURIDE IRON WORKS CO.
WEMCO—SEE WESTERN MA-
CHINERY CO.
WESTERN MACHINERY CO.
Westinghouse Air Brake Co., Le
Roy Div.

AIR DRIVEN TOOLS

See Tools, Air Driven

AIR LEG

ACKER DRILL CO., INC.
ATLAS COPCO A.B.
CHICAGO PNEUMATIC TOOL CO.
Cleveland Div., Westinghouse Air
Brake Co.
Consolidated Pneumatic Tool Co.,
Ltd.
Demag Aktiengesellschaft
FLOTTMANN-WERKE GMBH
GARDNER-DENVER CO.
Hardypick Ltd.

HOLMAN BROS. LTD.

Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
MACHINERY CENTER, INC.
TELLURIDE IRON WKS.
THOR POWER TOOL CO.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Roy Div.

AMALGAMATORS

CLARK-TODD—SEE MINE &
SMELTER SUPPLY CO., THE
DENVER EQUIPMENT CO.
FRASER & CHALMERS ENG.
WORKS
KLOCKNER-HUMBOLDT-
DEUTZ, A. G.
Mill & Mine Supply, Inc.
MINE & SMELTER SUPPLY CO.
Miners Foundry & Mfg. Co.
TELLURIDE IRON WORKS, CO.
Yuba Consolidated Industries Inc.

ARMS AND POSTS

PNEUMATIC

CHICAGO PNEUMATIC TOOL CO.
Coeur d'Alene Hardware & Foundry
Co.
GARDNER-DENVER CO.
SKINNINGROVE IRON CO. LTD.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Roy Div.

MECHANICAL

CHICAGO PNEUMATIC TOOL CO.
Cleveland Div., Westinghouse Air
Brake Co.
Coeur d'Alene Hardware & Foundry
Co.
GARDNER-DENVER CO.

HOLMAN BROS. LTD.

INGERSOLL-RAND CO.
SKINNINGROVE IRON CO. LTD.
THOR POWER TOOL CO.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co. (Pa.)
Westinghouse Air Brake Co., Le Roy
Div.

ASSAY SUPPLIES

See Laboratory Equipment

ASSAYERS

See Laboratories & Assayers

AUGERS

See Drills; Bits

BAG FILLING MACHINES

Bemis Bro. Bag Co.
Richardson Scale Co.

BAGS

FILTER BAGS

American Air Filter Co., Inc.
Arizona Bag Co.
Bemis Bro. Bag Co.
EIMCO CORP., THE
Hazemag USA, Inc.
Filtration Engineers Div., American
Machine & Metals, Inc.
Filter Fabrics, Inc.
HAZEMAG OF GERMANY
Mine Safety Appliances Co.

Ball Mills

National Filter Media Corp.
NORTHERN BLOWER CORP.
PETERSON FILTERS & ENGINEERING CO.
 Pendleton Woolen Mills
 Westinghouse Air Brake Co., Le
 Roi Div.
 Wheelabrator Corp.

ORE AND CONCENTRATE BAGS

Arizona Bag Co.
 Bemis Bro. Bag Co.
 Crown Zellerbach Corp.
 Filter Fabrics, Inc.

SAMPLE BAGS

Arizona Bag Co.
 Bemis Bro. Bag Co.
 DFC—SEE DENVER FIRE CLAY CO., THE
 Filter Fabrics, Inc.
 Hammond Bag & Paper Co.
 Hanover Industries, Inc.
 Tamping Bag Co., The
 Union Bag & Paper Co.

BALL MILLS

See Grinding Equipment

BALLS

See Grinding Equipment

BATTERIES

See also Safety Equipment

AUTOMOTIVE AND LIGHT PLANT

C&D Batteries, Inc.
 ELECTRIC STORAGE BATTERY CO., THE EXIDE INDUSTRIAL DIV.
 GATES RUBBER CO.
 GENERAL MOTORS OVERSEAS OPERATIONS
 The General Tire & Rubber Co.
 Gould-National Batteries, Inc.
 GRAYBAR ELECTRIC CO., INC.
 INTERNATIONAL B. F. GOODRICH
 Oldham & Son, Ltd.
 Ray-O-Vac Co.

LOCOMOTIVE

C & D Batteries, Inc.
 C & D Silver-Clad—See C & D Batteries, Inc.
 Edison Inc., Thomas A.
 ELECTRIC STORAGE BATTERY CO., THE EXIDE INDUSTRIAL DIV.
 EXIDE-IRONCLAD—SEE ELECTRIC STORAGE BATTERY CO., THE EXIDE INDUSTRIAL DIV.
 Gould-National Batteries, Inc.
 INTERNATIONAL B. F. GOODRICH
 McGraw Edison Co.
 Oldham & Son, Ltd.

BATTERY CHARGERS

See Chargers, Battery

BEARINGS

BALL

Dodge Mfg. Corp.
 General Motors Corp., New Departure Div.
 Link-Belt Co.
 Pollard Bearings Ltd.
 S K F Industries Inc.

ROLLER

Chain Belt Company
 Dodge Mfg. Co.
 Friction Fighter—See Link-Belt Co.
 Pollard Bearings Ltd.
 S K F Industries Inc.
TIMKEN ROLLER BEARING CO.

SLEEVE

AMERICAN BRAKE SHOE CO., EXPORT DIV.
 AMERICAN BRAKE SHOE CO.
 Ampco Metal, Inc.
 Ampco Metal Bronze—see Ampco Metal, Inc.
 Birkett, Billings & Newton, Ltd.
 Continental Conveyor & Equip. Co.
 Dodge Mfg. Corp.
 Gathe Corporation
 Jeffrey Mfg. Co.

Link-Belt Co.
 SKF Hellefors Jernverk
 Sleeve—see Dodge Mfg. Co.
 STEARNS-ROGER MFG. CO.

PILLOW BLOCKS

Chain Belt Co.
 Connellsville Mfg. & Mine Supply Co.
 Continental Conveyor & Equip. Co.
 Dodge Mfg. Corp.
 GM Corp., New Departure Div.
 HEWITT-ROBINS, INC.
 Jeffrey Mfg. Co.
 Pollard Bearings Ltd.
 SKF Industries, Inc.
 Stephens-Adamson Mfg. Co.

BELL SYSTEMS

See Communications

BELTS AND BELTING

See also Conveyor Equipment; Fasteners, Belt; Safety Equipment

CHAIN LINK AND METAL

AMERICAN BRAKE SHOE CO.
 American Chain & Cable Co., Inc.
 American Chain Div.
 AMERICAN MANGANESE STEEL DIV., AMERICAN BRAKE SHOE CO.
 COLORADO FUEL & IRON CORP., THE
 Conveyor Co.
 ESCO—see Electric Steel Foundry Co.
 Gutehoffnungshütte Sterkrade AG.
 HACK ENGINEERING CO.
 HEWITT-ROBINS, INC., ROBINS CONVEYORS DIV.
 Korb-Pettit Wire Fabrics & Iron Works, Inc.
 LXS—see Link-Belt Co.
 Morse Chain Co.
 Taylor-Wharton Iron & Steel Co.
 TELLURIDE IRON WKS.
 Thiele, August G.m.b.H.
 U. S. Rubber Co.
 U. S. Steel
 U. S. STEEL EXPORT CO.
 Yuba Manufacturing Div.
 WISCO—SEE COLORADO FUEL & IRON CORP.

LEATHER BELTING

Carlyle Rubber Co., Inc.
 Dodge Mfg. Corp.
 GATES RUBBER CO.
 GOODALL RUBBER CO.
 HACK ENGINEERING CO.
 Houghton & Co., E. F.
 MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
 Tannate—see Rhoads & Son, J. E.
 Vim-Tred—see Houghton & Co., E. F.
 Williams & Sons, I. B.

RUBBER BELTING

H E Mining Engineers Co. Ltd.
 HEWITT-ROBINS, INC.
 Lee Rubber & Tire Corp., Republic Rubber Div.
 Morse Chain Co.
 Thermoid Rubber Co.
 Turner Bros. Asbestos Co. Ltd.

Flat Belts

AJAX—SEE HEWITT-ROBINS, INC.
 American Bilrite Rubber Co., Boston Woven Hose & Rubber Div.
 American Rubber Mfg. Co.
 Geo. Angus & Co. Ltd.
 Barber-Greene Company
 Boston Woven Hose & Rubber Co.
 BRITISH NYLON SPINNERS LTD.
 Carlyle Rubber Co., Inc.
 Challenger—see Lee Rubber & Tire Corp., Republic Rubber Div.
 CONSERVO—SEE HEWITT-ROBINS, INC.
 Conveyor Co.
 GATES RUBBER CO.
 GOODALL RUBBER CO.
 GOODRICH CO. B. F., THE INDUSTRIAL PROD. DIV.
 Goodyear Tire & Rubber Co.
 HEWITT-ROBINS, INC.
 INTERNATIONAL B. F. GOODRICH
 Korb Pettit-Wire Fabrics & Iron Wks., Inc.
 Lee Rubber & Tire Corp., Republic Rubber Div.
 MALTESE CROSS—SEE HEWITT-ROBINS, INC.

Porter Company, Inc., H. K.
 Quaker Rubber Co.
 Raybestos-Manhattan, Inc.
 Republic Rubber Div., Lee Rubber & Tire Corp.
 Rhoads, J. E. & Sons
 Rubber Improvement Ltd.
 Thiele, August G.m.b.H.
 Thermoid Rubber Co.
 Turner Bros. Asbestos Co. Ltd.
 United States Rubber Co.
 United States Rubber Int'l.
 Williams & Sons, I. B.
 Yosemite—see American Rubber Mfg. Co.

V-Belts

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 American Bilrite Rubber Co., Boston Woven Hose & Rubber Div.
 Boston Woven Hose & Rubber Co.
 Carlyle Rubber Co., Inc.
 Conveyor Co., The
 Dayton Rubber Co.
 Dodge Manufacturing Corp.
 Dunlop Rubber Co. Ltd.
 GATES RUBBER CO.
 GOODALL RUBBER CO.
 GOODRICH CO. B. F., THE INDUSTRIAL PRODUCTS CO.
 GOODYEAR INTERNATIONAL CORP.
 Goodyear Tire & Rubber Co.
 HEWITT-ROBINS, INC.
 INTERNATIONAL B. F. GOODRICH
 Lee Rubber & Tire Corp., Republic Rubber Div.
 Link-Belt Co.
 MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
 Porter Company, Inc., H. K.
 Quaker Pioneer Rubber Mills
 Quaker Rubber Co.
 Raybestos-Manhattan, Inc.
 Republic Rubber Div., Lee Rubber & Tire Corp.
 TERROPE—SEE ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 Thermoid Rubber Co.
 United States Rubber Co.
 United States Rubber Int'l.
 Wigginsworth & Co. Ltd., Frank
 Williams & Sons, I. B.
 Worthington Corp.

BINS, CHUTES, HOPPERS

& ACCESSORIES

See also Feeders

BINS AND CHUTES

Allison Steel Mfg. Co.
 AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
 AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Baker Perkins Ltd.
 Barber-Greene Co.
 Bethlehem Steel Co.
 Butler Manufacturing Company
 Columbian Steel Tank Co.
 Com-Bin Feeder—see Pulva Corp.
 Connellsville Mfg. & Mine Supply Co.
 Davison & Co. (Hexham) Ltd.
 FRASER & CHALMERS
 GENERAL ELECTRIC CO., LTD., THE
 Gutehoffnungshütte
 HACK ENGINEERING CO.
 HEAD WRIGHTSON, STOCKTON FORGE LTD.
 Henschel Maschinenfabrik, Hermann
 HEWITT-ROBINS INC.
 Hirsch Bros. Machinery Co.
 Hockensmith Corp., The
 INTERNATIONAL B. F. GOODRICH CORP.
 Iowa Manufacturing Co.
 Irwin Foundry & Mine Car Co.
 Jeffrey Mfg. Co.
 Kennedy-Van Suan Mfg. & Eng. Corp.
 KLOCKNER-HUMBOLDT-DEUTZ, A. G.
 Koehring Co., Johnson Co., C. S. & subd.
 Link-Belt Co.
 Lippmann Engineering Works
 Mayo Tunnel & Mine Equip.
 McNally Pittsburgh Mfg. Co.
 Miners Foundry & Mfg. Co.
 NATIONAL IRON CO.
 Ogden Iron Works Co.
 Peggson Ltd.

Pettibone Mulliken Corp.
 Pioneer Engineering Works, Inc.
 Pollock Co., The Wm. B.
 Porter Company, Inc., H. K.
 Richardson-Scale Co.
 Sanford-Day Iron Works, Inc.
 SANTA FE TANK DIV., FLUOR PRODS. CO.
 Smith Engineering Works
 STEARNS-ROGER MFG. CO.
 Stephens-Adamson Mfg. Co.
 STURTEVANT MILL CO.
 SUTCLIFFE LTD. RICHARD
 Taylor-Wharton Iron & Steel Co.
 TELLURIDE IRON WORKS CO.
 United States Steel Co.
 Universal Engineering Corp.
 Washington Machinery Co.
 Watt Car & Wheel Co., The
 Yuba Consolidated Industries, Yuba Mining Div.

GATES, LIPS, ETC.

Allison Steel Mfg. Co.
 Aluminum Co. of America
 AMERICAN MANGANESE STEEL DIV. AMERICAN BRAKE SHOE CO.
 Connellsville Mfg. & Mine Supply Co.
 Conveyor Co., The
 FRASER & CHALMERS ENG. WORKS.
 GENERAL ELEC. CO OF ENGLAND, LTD.
 Gutehoffnungshütte AG
 HACK ENGINEERING CO.
 Henschel Maschinenfabrik, Hermann
 Hirsch Bros. Machinery Co.
 Irwin Sensenich Corp.
 Jeffrey Mfg. Co.
 KLOCKNER-HUMBOLDT-DEUTZ, A. G.
 Koehring Co., Johnson Co., C. S.
 Link-Belt Co.
 Lippmann Engineering Works
 McNally Pittsburgh Mfg. Co.
 Miners Foundry & Mfg. Co.
 NATIONAL IRON CO.
 NATIONAL MALLEABLE & STEEL CASTINGS CO.
 Ogden Iron Works Co.
 Peggson Ltd.
 Pioneer Engineering Div., Poor & Co., Inc.
 Richardson Scale Co.
 Roberts & Schaefer Co.
 Sanford-Day Iron Works, Inc.
 Smith Engineering Works
 Stephens-Adamson Mfg. Co.
 Taylor-Wharton Iron & Steel Co.
 TELLURIDE IRON WORKS CO.
 Universal Dredge Mfg. Co.
 Universal Engineering Corp.
 U. S. Steel
 Washington Machinery Co.

INDICATORS

Bin-Dicator Co., The
 Conveyor, Inc.
 Conveyor Co., The
 DENVER EQUIPMENT CO.
 Euclid Electric & Mfg. Co., The
 FRASER & CHALMERS ENG. WORKS
 GENERAL ELECTRICAL CO. OF ENGLAND, LTD.
 HEWITT-ROBINS, INC.
 Hirsch Bros. Machy. Co.
 INDUSTRIAL PHYSICS & ELECTRONICS CO.
 Jeffrey Mfg. Co., The
 Koehring Co., Johnson Co., C. S.
 McNally Pittsburgh Mfg. Co.
 Richardson Scale Co.
 ROBIN TRONIC—SEE HEWITT-ROBINS, INC.
 Tellevel—see Stephens-Adamson Mfg. Co.
 TELLURIDE IRON WKS.

VIBRATORS

Barber-Greene Co.
 Carrier Conveyor Corp.
 Cleveland Vibrator Co., The
 Consolidated Pneumatic Tool Co., Ltd.
 DENVER EQUIPMENT CO.
 Eries Mfg. Co.
 FLOTTMANN-WERKE GMBH
 FRASER & CHALMERS ENG. WORKS
 GARDNER-DENVER CO.
 GENERAL ELECTRIC CO. LTD., THE
 HEWITT-ROBINS, INC.
 Jeffrey Mfg. Co.
 KENNEDY-VAN SAUN MFG. CO.
 LINK-BELT CO.
 Lippmann Engineering Works
 Scott's Concentrators
 Sheepbridge Equip. Ltd.

SHERWEN—SEE GENERAL ELEC. CO. OF ENGLAND, LTD.
 Stephens-Adamson Mfg. Co.
 Syntroon Co.
TY-SPEED—SEE TYLER CO., THE W. S.
TYLER CO., THE W. S.
 Universal Engineering Corp.

BITS

See also Steel; Diamond Bit Re-setting Service; Tungsten Carbide Products

AUGER BITS

ACKER DRILL CO., INC.
AMERICAN BRAKE SHOE CO.
 Carboly—see General Electric Co.
 Metallurgical Products Dept.
 Cardox Corp.
 Central Mine Equipment Co.
 Coal Master—see Central Mine Equipment Co.
 Coeur d'Alene Hardware & Foundry Co.
 English Drilling Equipment Co. Ltd.
 Failing Co., Geo. E.
 Firth Sterling Inc.
 Firth Sterling Inc.
GARDNER-DENVER CO.
 General Electric Co., Metallurgical Products Dept.
HOLMAN BROS. LTD.
 SKF Hellefors Jernverk
 Kennametal Inc.
 Kerfmaster—see Central Mine Equipment Co.
 LeGrand Sutcliffe & Gell Ltd.
 Mobile Drilling Inc.
 Pennsylvania Drilling Co.
 Salem Tool Co.
SALZGITTER MASCHINEN A. G.
THOR POWER TOOL CO.
 Vascology-Ramet Corp.

CHURN BITS

Bucyrus-Erie Co.
 General Electric Co., Carboly Dept.
 LeGrand Sutcliffe & Gell Ltd.
 Mill Iron Works, Inc.
 Mobile Drilling, Inc.
SPANG & CO.
 Westinghouse Air Brake Co., Le Roi Div.

CUTTING MACHINE

Carboly—see General Electric Co.
 Metallurgical Products Dept.
FLOTTMANN-WERKE GMBH
 Goodman Mfg. Co.
 Jeffrey Mfg. Co.
 KENNAMETAL, INC.

DIAMOND BITS

ACKER DRILL CO., INC.
 American Coldset Corp.
ASCOLITE—SEE SMIT & CO., ANTON
BOYLES BROS. DRILLING CO.
 Boyles Bros. Drilling Co., Ltd., (Canada)
BRONZOLITE—SEE SMIT & CO., INC., ANTON
 Champion Diamond Co.
CHICAGO PNEUMATIC TOOL CO.
CHRISTENSEN DIAMOND PRODUCTS CO.
DIAMOND DRILL CONTRACTING CO.
DIAMOND TOOL RESEARCH CO., INC.
 Drilling Accessory & Mfg. Co., Inc.
 English Drilling Equipment Co.
 Failing Co., Geo. E.
 General Electric Co., Carboly Dept.
 Havlick, J. L.
HOFFMAN—SEE STANCO
 Hoffman Bros. Drilling Co.
IMPRAGNOLITE—SEE SMIT & CO., INC., ANTON
JOY MANUFACTURING CO.
 Koebel Diamond Tool Co.
 Koebellite—see Koebel Diamond Tool Co.
LONGYEAR CO., E. J.
MCCLINTOCK CO., R. S.
 Mobile Drilling Inc.
NICOLITE—SEE SMIT & CO., INC., ANTON
 Pennsylvania Drilling Co.
 Perma-set—see Boyles Bros. Drilling Co., Ltd.
ROSSET—SEE SPRAGUE & HENWOOD, INC.
SMIT & CO., INC., ANTON
 Smit & Sons, Inc., J. K.
 Smit & Sons (Diamond Tools) Ltd., J. K.
SPRAGUE & HENWOOD, INC.
STANCO MFGS. & SALES, INC.
 Svenska Diamantbergnings AB.

TELLURIDE IRON WORKS CO.
THOR POWER TOOL CO.
TUFSET—SEE SPRAGUE & HENWOOD, INC.
TRUCAST—SEE SPRAGUE & HENWOOD, INC.
 L. M. Van Moppen & Sons
VAREL DIAMOND PRODUCTS CO.
VAREL MANUFACTURING CO.
 Wheel Trusing Tool Co.
 Winter, Ernst & Son

PERCUSSION BITS

American Coldset Corp.
RAND CO.
CHRISTENSEN DIAMOND PRODUCTS CO.
 Cleveland Rock Drill Div., Westinghouse Air Brake Co.
 Demag
 English Drilling Equipment Co.
 Fagersta Steels Pacific, Inc.
 Failing Co., Geo. E.
 Firth Sterling, Inc.
 Firth Sterling—see Firth Sterling, Inc.
GARDNER-DENVER CO.
 General Electric Co., Carboly Dept.
 Halifax Tool Co. Ltd.
 Hardypick Ltd.
 Harries—see American Coldset Corp.
 Hillman Co., Inc., C. Kirk
HOLMAN BROS. LTD., (ENGLAND)
 Holman Brothers (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
 Junction Bit & Tool Co.
KENNAMETAL INC.
LIDDICOAT—SEE WESTERN ROCK BIT MFG. CO.
 Marcar & Co. Ltd., Alexander
 McCauley Industrial Corp.
 Metal Carbides Corp.
 Minerals Engineering Co., (Colo.)
 Mobile Drilling Inc.
 Powermite Drill & Tool Co.
 von Rautenkranz, Hermann
 Rip-Bits, Ltd.
ROK BITS—SEE BRUNNER & LAY INC.
SANDVIK COROMANT—SEE ATLAS COPCO
 Schramm, Inc.
SPANG & CO.
THOR POWER TOOL CO.
 Throwaway Bit Corp.
TIMKEN—SEE TIMKEN ROLLER BEARING CO.
TIMKEN ROLLER BEARING CO.
 Uddeholms Aktiebolag
 Vascology-Ramet Corp.
WESTERN ROCK BIT MANUFACTURING CO.
 Westinghouse Air Brake Co., Cleveland Rock Drill Div.
 Westinghouse Air Brake Co., Le Roi Div.
ROTARY BITS
ACKER DRILL CO., INC.
 Blue Demon—see Hawthorne, Inc., Herb J.
BRUNNER & LAY, INC.
 Central Mine Equipment Co.
CHICAGO PNEUMATIC TOOL CO.
 Damco—see Drilling Accessory & Mfg. Co., Inc.
 Demo Tool Co.
 Drilling Accessory & Mfg. Co., Inc.
 English Drilling Equipment Co.
 Fagersta Steels Pacific, Inc.
 Failing Co., Geo.
 Firth Sterling, Inc.
 Firth Sterling—see Firth Sterling, Inc.
FLOTTMANN-WERKE GMBH
GARDNER-DENVER CO.
 General Electric Co., Metallurgical Products Dept.
 Hardypick Ltd.
 Hawthorne, Inc., Herb J.
 Hitchcock Mfg. Co., Leo
 Hoffman Bros. Drilling Co.
HOLMAN BROS. LTD.
HUGHES TOOL CO.
JOY MFG. CO.
KENNAMETAL INC.
 Kerfmaster—see Central Mine Equipment Co.

LONGYEAR CO., E. J.
 Marcar & Co. Ltd., Alexander
 Mine Safety Appliances Co.
 Mobile Drilling, Inc.
 Oil Tool Mfg. Co.
 Powermite Drill & Tool Co., Security Engineering Div.
 von Rautenkranz, Hermann
SMIT & CO., INC., ANTON
SPRAGUE & HENWOOD, INC.
STANCO MFG. & SALES, INC.
 Stripmaster—see Central Mine Equipment Co.
THOR POWER TOOL CO.
VAREL MFG. CO.
 Vascology-Ramet Corp.
 Westinghouse Air Brake Co., Le Roi Div.
 Winter Weiss Co., The

BLASTING SUPPLIES

BLASTING MACHINES

AMERICAN CYANAMID CO., EXPLOSIVES & MINING CHEMICALS DEPT.
 Apache Powder Co.
ATLAS POWDER CO.
 Coeur d'Alene Hardware & Foundry Co.
 du Pont de Nemours & Co., E. I., Explosives Div.
 Electro-Technical Labs.
HERCULES POWDER CO.
 Imperial Chemical Industries
 Mine Safety Appliances Co.
 Olin Mathieson Chem. Corp., Explosives Div.
SHOT MASTER—SEE ATLAS POWDER CO.
 Trojan Powder Co.

DETONATING FUSES

AMERICAN CYANAMID CO., EXPLOSIVES & MINING CHEMICALS DEPT.
AMERICAN CYANAMID CO., ORGANIC CHEMICALS DIV.
 Apache Powder Co.
ATLAS POWDER CO.
 Canadian Safety Fuse Co., Ltd.
COAST MFG. & SUPPLY CO.
 Coeur d'Alene Hardware & Foundry Co.
 du Pont de Nemours & Co., E. I., Explosives Div.
 Ensign-Bickford Co., The
HERCULES POWDER CO.
 Imperial Chemical Industries
 National Fuse & Powder Co.
 Primacord—see Canadian Safety Fuse Co., Ltd.
 Trico Fuse Mfg. Co.
 Trojan Powder Co.
 Walker Machinery Co.

ELECTRIC CAPS

AMERICAN CYANAMID CO., EXPLOSIVE DEPT.
 Apache Powder Co.
ATLAS POWDER CO.
 Coeur d'Alene Hardware & Foundry Co.
 du Pont de Nemours & Co., Inc., E. I., Explosives Div.
HERCULES POWDER CO.
 Olin Mathieson Chem. Corp., Explosives Div.
ROCKMASTER—SEE ATLAS POWDER CO.
 Spencer Chemical Company
 Trojan Powder Co.
 Walker Machinery Co.

EXPLOSIVES

ACCOMITE—SEE AMERICAN CYANAMID CO. ORGANIC CHEM. DIV.
AMERICAN CYANAMID CO., EXPLOSIVES & MINING DEPT.
 Apache Powder Co.
ATLAS-GIANT—SEE ATLAS POWDER CO.
ATLAS POWDER CO.
 Coeur d'Alene Hardware & Foundry Co.
 Collier Carbon and Chemical Corp.
 du Pont de Nemours & Co., Inc., E. I., Explosives Div.
HERCULES POWDER CO.
 Illinois Powder Mfg. Co.
 Imperial Chemical Industries
 International Geophysics, Inc.

Multipulse—see International Geophysics, Inc.
 Olin Mathieson Chem. Corp., Explosives Div.
 Spencer Chemical Company
 Trojan Powder Co.
 Walker Machinery Co.

SAFETY FUSES

AMERICAN CYANAMID CO., EXPLOSIVES & MINING DEPT.
 Apache Powder Co.
ATLAS POWDER CO.
 Black Clover—see Canadian Safety Fuse Co., Ltd.
 Canadian Safety Fuse Co., Ltd.
COAST MFG. & SUPPLY CO.
 Coeur d'Alene Hardware & Foundry Co.
 du Pont de Nemours & Co., E. I., Explosives Div.
 Ensign-Bickford Co., The
HERCULES POWDER CO.
 Imperial Chemical Industries
 National Fuse & Powder Co.
 Olin Mathieson Chem. Corp., Explosives Div.
 Trojan Powder Co.
 Walker Machinery Co.

ACCESSORIES—other than above

Air Placement Equipment
AMERICAN BRATTICE CLOTH CORP.
AMERICAN CYANAMID CO., EXPLOSIVE DEPT.
 Apache Powder Co.
ATLAS POWDER CO.
 Bemis Bro. Bag Co.
 Canadian Safety Fuse Co., Ltd.
COAST MFG. & SUPPLY CO.
 Coeur d'Alene Hardware & Foundry Co.
 Coleman Cable & Wire Co.
 du Pont de Nemours & Co., Inc., E. I., Explosives Div.
 Economy Fuse & Mfg. Co.
 Ensign-Bickford Co.
HERCULES POWDER CO.
 Mine Safety Appliances Co.
 National Fuse & Powder Co.
NATIONAL MINE SERVICE CO.
 Olin Mathieson Chem. Corp., Explosive Dept.
 Primacord—see Ensign-Bickford Co.
 Tamping Bag Co., The
 Trico Fuse Mfg. Co.
 Trojan Powder Co.
 Walker Machinery Co.

BLOCKS & SHEAVES

See also Conveyor Equipment

All Castee—see Vulcan Iron Works (Pa.)
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP, EXPORT DIV.
ALLOY STEEL & METALS CO.
AMERICAN BRAKE SHOE CO.
 American Hoist & Derrick Co.
 Crosby-Laughlin Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Austin Hopkinson & Co. Ltd.
 Bethlehem Steel
CARD IRON WORKS CO., THE
 C. S.
CHICAGO PNEUMATIC TOOL CO.
 Connelville Mfg. & Mine Supply Co.
 Demag Aktiengesellschaft
 Dodge Manufacturing Corp.
DUROLITE—SEE SAUERMAN BROS., INC.
 Failing Co., Geo. E.
FLOTTMANN-WERKE GMBH
 Grifphoist, Inc.
 Hadfields Ltd.
HEWITT-ROBINS, INC.
 Hirsch Bros. Machine Co., Inc.
 Hockensmith Corp., The
 Irwin Sensenich Corp.
 Jeffrey Mfg. Co.
 Jones Foundry & Machine Co., W. A.
JOY MANUFACTURING CO.
 Joy-Sullivan Ltd.
KEENEY CO., PAUL E. (ROPE MASTER)
LAKE SHORE INC.
MCANABIAN & STONE CORP.
NATL. MALLEABLE & STEEL CASTINGS CO.
 Nat'l Supply Co., The
 Ohio Hoist & Mfg. Co.
PACIFIC—SEE ALLOY STEEL & METALS CO.
 Princeton Grifphoist Inc.
RIBLET TRAMWAY CO.
ROPE MASTER—SEE KEENEY CO., PAUL E.
 Sanford-Day Iron Works, Inc.
SAUERMAN BROS., INC.

Manufacturers' Complete Names and Addresses are listed on the last pages of this yellow section. Advertisers in this issue are listed in boldface capital letters.

Blowers

SKOOKUM CO.
Taper-Loek—see Dodge Mfg. Co.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS.
TOOL STEEL GEAR & PINION CO., THE
Vulcan Iron Works Co. (Colo.)
Vulcan Iron Works Co. (Pa.)
Washington Iron Works
Worthington Corporation
Yuba Manufacturing Co.

BLOWERS

See Ventilation Equipment and Blowers

BODIES

See Trucks and Trailers; Mine Cars

BOLTS, ROCK

ALIMAK CORP.
ALIMAK VERKEN A/B
Bethlehem Steel
CF&I—SEE COLORADO FUEL & IRON CORP., THE
Commercial Shearing & Stamping Co., The
Dowry Mining Equipment, Ltd.
Elreco Corp., The
Fagersta Steels Pacific Inc.
Gutehoffnungshütte, AG
HOLMAN BROS. LTD.
INTERNATIONAL HARVESTER CO.
MACHINERY CENTER, INC.
Ohio Brass Co.
Oliver Iron & Steel Corp.
Republic Steel Corp.
SHEFFIELD STEEL DIV., ARMCO STEEL CORP.
TELLURIDE IRON WORKS.
U. S. Steel Corp.—Tennessee Coal & Iron Div.
UNITED STATES STEEL EXPORT CO.
Youngstown Sheet & Tube Co., The

BOOM ASSEMBLIES

See Drills; Excavators

BORTZ

See Diamonds, Industrial

BUCKETS AND TEETH

See also Hoisting Equipment; Tramways, Aerial; Dredges and Dredge Buckets; Conveyors

CLAMSHELL

Blaw-Knox Co., Blaw-Knox Div.
Coeur d'Alene Company, The
Eco—see Electric Steel Foundry Co.
Gar Wood Industries, Inc.
Haise Mfg. Co., Geo.
HARNISCHFEGGER CORP.
Heyl & Patterson, Inc.
Koehring Co.
Link Belt Speeder Corp.
McDowell Co., Inc.
Marcar & Co. Ltd., Alexander
Owen Bucket Co.
Priestman Bros. Ltd.
Schield Bantam Co.
Williams—see McDowell Co., Inc.
Yuba Consolidated Indus., Yuba Mining Div.

DAGLINE

Bucyrus-Erie Co.
CRESCENT—SEE SAUERMAN BROS., INC.
Eco—see Electric Steel Foundry Co.
Gar Wood Industries, Inc.
HADFIELDS LTD.
McDowell Co., Inc.
Priestman Bros. Ltd.
Page Engr. Co.
Petitbone Muliken Corp.
SAUERMAN BROS. INC.
Schield Bantam Co.
Taylor-Wharton Iron & Steel Co.
Williams—see McDowell Co., Inc.
Yuba Consolidated Indus., Yuba Mining Div.

DREDGE

AMERICAN BRAKE SHOE CO.
AMERICAN BRAKE SHOE CO., EXPORT DIV.
AMERICAN MANGANESE STEEL DIV., AMER. BRAKE SHOE CO.
Columbia Steel Casting Co. Inc.
ESCO—SEE ELECTRIC STEEL FOUNDRY CO.
Gar Wood Industries, Inc.
I. H. C. Holland
Hadfields Ltd.
McDowell Co., Inc.
Priestman Bros., Ltd.
Williams—see McDowell Co., Inc.
Yuba Consolidated Indus., Mining Div.

SHOVEL

AMERICAN MANGANESE STEEL DIV., AMER. BRAKE SHOE CO.
AMERICAN BRAKE SHOE CO., EXPORT DIV.
BUCYRUS-ERIE CO.
ESCO—SEE ELECTRIC STEEL FOUNDRY CO.
Gar Wood Industries, Inc.
LIBU SHOVEL CO.
Marcar & Co. Ltd., Alexander
Petitbone Muliken Corp.
Priestman Bros. Ltd.
Schield Bantam Co.
Taylor-Wharton Iron & Steel Co.

TEETH

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMERICAN BRAKE SHOE CO., EXPORT DIV.
COLUMBIA STEEL CASTING CO., INC.
Eco—see Electric Steel Foundry Co.
Gar Wood Industries, Inc.
Hadfields Ltd.
Joost Manufacturing Co.
Marcar & Co. Ltd., Alexander
McDowell Co., Inc.
NATIONAL IRON CO.
NATIONAL MALLEABLE & STEEL CASTINGS
Schield Bantam Co.
Priestman Bros. Ltd.
Williams—see McDowell Co., Inc.

BUILDINGS,

PREFABRICATED

Allison Steel Mfg. Co.
Aluminum Co. of America
Armco Drainage & Metal Products, Inc.
Bethlehem Steel
Blaw-Knox Co., Blaw-Knox Div.
Butler Manufacturing Co.
Columbian Steel Tank Co.
HARNISCHFEGGER CORP.
Hirsch Bros. Machine Co., Inc.
Republic Steel Corp., Truscon Steel Div.
Sheepbridge Equip. Ltd.
U. S. Steel Corp.
UNITED STATES STEEL EXPORT CO.

BULLDOZERS

See Tractors and Attachments

BURNERS, OIL, GAS AND COAL

BABCOCK & WILCOX CO., THE
Coppas Engineering Corp.
DFC—SEE DENVER FIRE CLAY CO., THE
Enterprise Engine & Machinery Co.
GENERAL MOTORS OVERSEAS OPERATIONS
Kennedy-Van Saun Mfg. & Eng. Corp.
KLOCKNER-HUMBOLDT-DEUTZ, A. G.
MINE & SMELTER SUPPLY CO.
SOUTHWESTERN ENGINEERING CO.
Surface Combustion Corp.

CABLE AND CONDUIT

See also Rope, Wire; Tramway, Aerial

ELECTRICAL CABLE AND CONDUIT

Aluminum Co. of America
Anaconda Wire and Cable Co.
Ateliers de Constructions Electriques de Charleroi
Bethlehem Steel
British Insulated Callender Cables, Ltd.
Canada Wire & Cable Co., Ltd.
Chase Brass & Copper Co.
COLEMAN CABLE & WIRE CO.
Collyer Insulated Wire Co.
Essex Wire Corp.
GENERAL CABLE CORP
General Electric Co.
GENERAL ELECTRIC CO. OF ENGLAND, LTD.
Glover, W. T. & Co., Ltd.
GRAYBAR ELECTRIC CO., INC.
Hitachi, Ltd.
GENERAL ELECTRIC CO., INTERNATIONAL
International Nickel Co.
Johns-Manville Sales Corp.
JOY MFG. CO.
MINE & SMELTER SUPPLY CO.
THE MARCY MILL DIVISION
National Supply Co., The
Okonite Company, Hazard Insulated Wire Works
Paranite Wire and Cable Div.
Phelps Dodge Copper Products Corp.
ROEBLING'S SONS CORP., JOHN
Div. of Alcoa
Rome Cable Corp.
Siemens & Halske A. G.
SIMPLEX WIRE & CABLE CO.
SPANG—SEE NATIONAL SUPPLY CO., THE
Sterling Cable Co. Ltd.
Tennessee Coal & Iron Div., U.S.S.
Tiger Brand—see U. S. Steel
United States Rubber Co.
U. S. Steel Corp., American Steel & Wire Div.
United States Steel Corp., Columbia Geneva Steel Div.
UNITED STATES STEEL EXPORT CO.
Youngstown Sheet & Tube Co., The

CABLE, TRAILING

British Insulated Callender's Cables, Ltd.
COLEMAN CABLE & WIRE CO.
Collyer Insulated Wire Company
Essex Wire Corp.
GENERAL CABLE CORP.
GENERAL ELECTRIC CO., LTD.
Glover, W. T. & Co., Ltd.
International Nickel Co.
Okonite Co., The
Sterling Cable Co. Ltd.
U.S. Steel, Columbia-Geneva Div.

CABLEWAYS, EXCAVATING

See Excavators

CAGES

See Hoisting Equipment

CALCINERS

See Dryers and Kilns; Pyrometallurgical Equipment

CAPS

See Blasting Supplies

CARBIDE PRODUCTS

See also Tungsten
Carbide Products
Adams Carbide Corp.
Air Reduction Sales Co.
AMERICAN MANGANESE STEEL DIV., AMERICAN BRAKE SHOE CO.
ATLAS COPCO AB
CHRISTENSEN DIAMOND PRODUCTS CO.

Fagersta Steels Pacific Inc.
Firth Sterling, Inc.
Industrial Air Products Co.
KENAMETAL, INC.
Monsanto Chemical Co.
National Carbide Co.
National Cylinder Gas Co.
SMIT & CO., INC., ANTON ...
Uddeholm Co. of America, Inc.
Union Carbide & Carbon Corp.—
Linde Air Products Co.
U. S. STEEL EXPORT CO.
Vascoloy-Ramet Corp.

CAR DUMPERS

ALLIS-CHALMERS MFG. CO.
Coeurdalenes Co.
Differential Steel Car Co.
GENERAL ELECTRIC CO., LTD.
Henschel Maschinenfabrik, Hermann
Hirsch Bros. Machine Co.
Heyl & Patterson, Inc.
HUDSON LTD., R.
Kacibie G.m.b.H., Carl
McNally Pittsburgh Mfg. Corp.

CAR PASSERS

AMERICAN MINE DOOR COMPANY
CANTON—SEE AMERICAN MINE DOOR COMPANY
CARD IRON WORKS.
Coeur d'Alene Company, The
(Coeur d'Alene Hdw. & Fdry, Co.)
Connellsville Mfg. & Mine Supply Co.
Gutehoffnungshütte, AG
HUDSON LTD., R.
Mayo Tunnel & Mine Equip.
Miners Foundry & Mfg. Co.
TELLURIDE IRON WORKS CO.

CAR SHAKERS

See Shakers, Car

CARS, MINE

See also Haulage Units, Off-rail
A C F Industries, Inc. American
Car & Foundry Div.
Allison Steel Mfg. Co.
Atlas Car & Mfg. Co., The
BALDWIN - LIMA - HAMILTON CORP.
Bethlehem Steel
Bischoff-Werke K. G.
CARD IRON WORKS CO., THE
C. S.
Simon Carves Ltd.
Coeur d'Alene Hardware & Foundry Co.
KW Dart Truck Co.
DENVER EQUIPMENT COMPANY
Differential Steel Car Co.
Easton Car & Construction Co.
GARDNER-DENVER COMPANY
GETMAN BROS. MFG. DIV., INC.
Gregg Co., Ltd., The
Gutehoffnungshütte
Hirsch Bros. Machinery Co.
Hitachi Ltd.
Hockersmith Corp. The
HUDSON, ROBERT, LTD.
Irwin Foundry & Mine Car Co.
Irwin Senenich Corp.
LAKE SHORE INC.
LOHED—SEE LAKE SHORE, INC.
Magor Car Corp.
Mayo Tunnel & Mine Equip.
Miners Foundry & Mfg. Co.
NC-1—SEE NATIONAL MALLEABLE & STEEL CASTINGS CO.
NATIONAL IRON CO.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
Ogden Iron Works Co.
Pacific Car & Foundry Co.
Sanford-Day Iron Works Co.
SCOOT-CRETE ORE CARRIER—SEE GETMAN BROS. MFG. DIV., INC.
Sheepbridge Equip. Ltd.
TELLURIDE IRON WORKS
Union Iron Works
United States Steel Corp.
U. S. Steel Corp., Columbia Geneva Steel Div.
UNITED STATES STEEL CORPORATION
United States Steel Corporation
UNITED STATES STEEL EXPORT CO.

Watt Car & Wheel Co., The
Westinghouse Air Brake Co., Le
Roi Div.

CELLS, FLOTATION

See Flotation Machines

CHAIN AND ACCESSORIES

AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.

Chain Belt Company
American Chain & Cable Co., Inc.,
American Chain Div.
Ameco—see American Brake Shoe
Co.
AMERICAN BRAKE SHOE CO.,
EXPORT DIV.
Electric Steel Foundry Co.
Link-Belt Co.
NATIONAL MALLEABLE &
STEEL CASTINGS CO.
Stephens-Adams Mfg. Co.

CHAIN HOISTS

Allison Steel Mfg. Co.
American Chain & Cable Co.,
Wright Hoist Div.
ASEA (ALLMANNA SVENSKA
ELEKTRISKA AKTIEBOLAGET
ATLAS COPCO AB, SWEDEN
CHICAGO PNEUMATIC TOOL CO.
Coffing Hoist Div., Duff-Norton Co.
GARDNER-DENVER CO.
GRAYBAR ELECTRIC CO., INC.
HARNISCHFEGER CORP.
INGERSOLL-RAND CO.
International Combustion (Export)
Ltd.
Loading—see Yale & Towne Mfg.
Co.
Lug-All Co., The
Mitchell Ropeways Ltd.
Morse Chain Co.
Oldham & Son, Ltd.
Republic Steel Corp.
Robbins & Myers, Inc.
THOR POWER TOOL CO.
Watson & McLean, Ltd.

CHARGERS, BATTERY

Acme Electric Corp.
ASEA
Bruce Peebles & Co., Ltd.
C&D Batteries, Inc.
ELECTRIC STORAGE BATTERY
CO., THE EXIDE INDUS-
TRIAL DIV.
Fairbanks, Morse & Co.
General Electric Co., Apparatus
Sales Div.
GENERAL ELECTRIC CO. LTD.
GENERAL ELECTRIC CO.,
INTERNATIONAL
Goodman Manufacturing Company,
Mancha Storage Battery Loco-
motive Div.
Gould-National Batteries, Inc.
GRAYBAR ELECTRIC CO., INC.
Greenaburgh Mach. Co.
Hitachi Ltd.
Hobart Bros. Co.
Kohler Co.
Lincoln Electric Co.
Lister-Blackstones, Inc.
McGraw Edison Co.
Mancha Storage Battery Locomotive
Div., Goodman Mfg. Co.
Mine Safety Appliances Co.
Oldham & Son Ltd.
Onan & Sons, Inc., D. W.
Sheppard Co., R. H.
Syntron Co.
Ward Leonard Electric Co.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.
Westinghouse Electric Corp.
Wingrove & Rogers Ltd.

CHEMICAL

CONCENTRATORS

See Concentrating Equipment

CHEMICALS

See Reagents and Chemicals

CHUTES

See Bins, Chutes

CLAMPS

See Couplings, Hose; Rope, Wire

CLARIFIERS

See Filters, Concentrate;
Thickeners and Tanks

CLASSIFIERS

See also Cyclones

AIR
Birtley Engineering Ltd.
Combustion Engineering Inc., Ray-
mond Div.
GENERAL ELEC. CO. OF ENG-
LAND, LTD.
HARDINGE CO., INC.
HAZEMAG U.S., INC.
Hirsch Bros. Machine Co., Inc.
International Combustion Products
Ltd.
Kennedy-Van Saun Mfg. & Eng.
Corp.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
Loesche, Germany
McNally Pittsburgh Mfg. Co.
Roberts & Schaefer
Scott's Concentrators
Sturtevant Eng. Co. Ltd.
STURTEVANT MILL CO.
Universal Road Machinery Co.
WEDAG
Williams Patent Crusher & Pul-
veriser Co.

HYDRAULIC
AKINS—SEE MINE & SMELTER
SUPPLY CO., THE
Davison & Co. (Hearns) Ltd.
CONCENCO—SEE DEISTER CON-
CENTRATOR CO., THE
DEISTER CONCENTRATOR CO.,
THE
Delater Machine Co.
DENVER EQUIPMENT CO.
DORR OLIVER, INC.
Dresser Stacey Co.
Dunham Mfg. & Sales Co., Gordon
Eagle Iron Works
EQUIPMENT ENGINEERS INC.
FRASER & CHALMERS ENGR.
WKS.

GENERAL ELECTRIC CO. OF
ENGLAND, LTD.
HARDINGE CO., INC.
Heyl & Patterson, Inc.
International Combustion Products
Ltd.
Kennedy-Van Saun Mfg. & Eng.
Corp.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.

Knapp & Bates Ltd.
McLANAHAN & STONE CORP.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO.,
THE

Smith Engineering Works
SOUTHWESTERN ENGR. CO.
Stokes & Co. Ltd., R.O.
TELLLUDE IRON WORKS CO.
WEDAG
WEMCO—SEE WESTERN MACH.
CO.

WESTERN MACH. CO.
Wilnot Engineering Co.

MECHANICAL
AKINS—SEE MINE & SMELTER
SUPPLY CO. & HEAD
WRIGHTSON, STOCKTON
FORGE, LTD.

Rird Machine Co.
Rush Engineering & Mfg. Co.
Combustion Engineering Inc.
DENVER EQUIPMENT CO.
DORR OLIVER, INC.
Dorr-Oliver G.m.b.H.
Eagle Iron Works
FRASER & CHALMERS ENGR.
WKS.
GENERAL ELECTRIC CO. LTD.,
THE
HARDINGE CO., INC.

HEAD WRIGHTSON, STOCKTON
FORGE LTD.
Hirsch Bros. Machine Co., Inc.
HOLMAN BROS. LTD.
International Combustion Products,
Ltd.
Iowa Mfg. Co.
Kennedy-Van Saun Mfg. & Eng.
Corp.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
Knapp & Bates Ltd.
Link-Belt Co.
Lippmann Engineering Works
Magnetic Engineering & Mfg. Co.
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
Miners Foundry & Mfg. Co.
Morse Bros. Machinery Co.
Smith Engineering Works
SOUTHWESTERN ENGINEERING
CO.
Stokes & Co. Ltd., R.O.
STURTEVANT MILL CO.
Union Iron Works
WEDAG
WEMCO—SEE WESTERN MA-
CHINERY CO.
Western Gear Corp. (Calif.)
WESTERN MACHINERY CO.

CLEANERS

See Filters; Scrubbers

CLOTH

See Filter Media; Screens, Griz-
zles and Accessories; Ventila-
tion Equipment

CLOTHING

See Safety Equipment

CLUTCH MECHANISMS

See also Friction Material

Dodge Mfg. Co.
Eaton Mfg. Co. Dynamic Divan.
General Motors Corp., New Depart-
ure Div.
Link-Belt Co., Export Div.
Marland One-Way Clutch Co.
Morse Chain Co.
Rolling-Grip—see Dodge Mfg. Co.
Stephens-Adams Mfg. Co.
Thermoid Rubber Co.
Twinn Disc Clutch Co.
The S. K. Wellman Co.
Wiglesworth & Co. Ltd., Frank

COLLECTORS

See Dust Collection Equipment

COLUMNS

See Arms and Pests

COMMUNICATIONS

BELL AND BUZZER SYSTEMS

Ateliers de Constructions Elec-
triques de Charleroi
Connecticut Telephone & Electric
Corp.

John Davis & Son, Ltd.
GENERAL ELECTRIC CO. OF
ENGLAND LTD.
GRAYBAR ELECTRIC CO., INC.
Lunger—see Edwards Co., Inc.
Signal Engr. & Mfg. Co.
Sterling Siren Fire Alarm Co., Inc.
United States Instrument Corp.

MINE TELEPHONES

Ateliers de Constructions elec-
triques de Charleroi
Connecticut Telephone & Electric
Corp.
FRASER & CHALMERS ENGR.
WKS.

Compressors & Accessories

GENERAL ELECTRIC CO. OF
ENGLAND, LTD.
GRAYBAR ELECTRIC CO., INC.
INDUSTRIAL PHYSICS &
ELECTRS. CO.
Mine Safety Appliances Co.
SIMPLEX WIRE & CABLE CO.
Sterling Siren Fire Alarm Co., Inc.
United States Instrument Corp.

RADIO SYSTEMS
Ateliers de Constructions elec-
triques de Charleroi
GENERAL ELECTRIC CO. OF
ENGLAND, LTD.
GENERAL ELECTRIC CO.,
INTERNATIONAL
GRAYBAR ELECTRIC CO., INC.
International Geophysics, Inc.
Mine Safety Appliances Co.
Motorola Communications & Elec-
tronics, Inc.
Sterling Siren Fire Alarm Co., Inc.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.

TROLLEY TELEPHONES
INDUSTRIAL PHYSICS &
ELECTRS. CO.
Mine Safety Appliances Co.
NATIONAL MINE SERVICE CO.
Sterling Siren Fire Alarm Co., Inc.
United States Instrument Corp.

COMPRESSORS & ACCESSORIES

PORTABLE

A.E.C. Limited
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO.,
AMERICAN MANGANESE
STEEL DIV.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
ATLAS COPCO, A. B.
Borsig AG.
Carrier Corp.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co.
Ltd.

Davey Compressor Co.
Demag Aktiengesellschaft
FLOTTMANN-WERKE GMBH
GARDNER-DENVER CO.
Goodman Mfg. Co.
Gutehoffnungshutte A.G.
GYRO-FLOW—SEE INGERSOLL-
RAND CO.

Hitachi, Ltd.
HOLMAN BROS., LTD. (ENG-
LAND)

Holman Brothers (Canada) Limited
HUMBOLDT, KLOCKNER-HUM-
BOLDT-DEUTZ AG
INGERSOLL-RAND CO.
Jaeger Machine Co., The
JOY MANUFACTURING CO.

Joy-Sullivan Ltd.
Le Roi Div., Westinghouse Air
Brake Co.

Lincoln Engineering Co.
Mosebach Electric & Supply, Mose-
bach Mfg. Co.
Olin Mathieson Chem. Corp., Expe-
sives Div.

Powermite Drill & Tool Co.
Ruston & Hornsby Ltd.
Schrann Inc.

Texas Gulf Sulphur Co.
UNTAIR—SEE JOY MANUFAC-
TURING CO.

Westinghouse Air Brake Co., Le
Roi Div.
Westinghouse Air Brake Co. (Pa.)
Worthington Corp.

STATIONARY

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
American Blower Div. of American
Standard
AMERICAN BRAKE SHOE CO.
AMERICAN MANGANESE
STEEL DIV.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.

Ateliers de Constructions Elec-
triques de Charleroi
ATLAS COPCO, A. B.
Borsig AG.
Carrier Corp.
CHICAGO PNEUMATIC TOOL
CO.

Consolidated Pneumatic Tool Co.,
Ltd.

Cooper-Bessemer Corp., The
Davey Compressor Co.
DeLaval Steam Turbine Co.
Demag Aktiengesellschaft
FLOTTMANN-WERKE GMBH
GARDNER-DENVER CO.
GENERAL ELECTRIC CO. OF
ENGLAND LTD.

**Manufacturers' Complete Names and Ad-
resses are listed on the last pages of this
yellow section. Advertisers in this issue
are listed in boldface capital letters.**

Concentrating Equipment

Hitachi Ltd.
**HOLMAN BROS., LTD., (ENG-
 LAND)**
 Helman Brothers (Canada) Limited
**HUMBOLDT, KLOCKNER-HUM-
 BOLDT-DEUTZ AG**
 Hycan Mfg. Co.
INGERSOLL-RAND CO.
 Jaeger Machine Co., The
JOY MANUFACTURING CO.
 Joy-Sullivan Ltd.
 Lima Electric Motor Co., The
 Lincoln Engineering Co.
 Olin Mathieson Chem. Corp., Ex-
 plodes Div.
**RO-FLO-SEE ALLIS-CHAL-
 MERS MFG. CO., INDUS-
 TRIES GROUP**
 Roots-Connorsville Blower Corp.
 Ruston & Hornsby Ltd.
 Schramm Inc.
 Texas Gulf Sulphur Co.
 Techn. Ind. en Handelsondernem-
 ing WEDAG A.G.
 Westinghouse Air Brake Co., In-
 dustrial Products Div.
 Westinghouse Air Brake Co., Le
 Roi Div.
 Worthington Corp.

CONCENTRATING EQUIPMENT

See also Classifiers; Flotation
 Machines, Magnetic Equipment;
 Grinding Equipment; Crushers;
 Separators

HEAVY MEDIA SEPARATION
AKINS-SEE MINE & SMELTER
SUPPLY CO., THE
**ALLIS-CHALMERS MFG. CO., IN-
 DUSTRIES GROUP**
 Birtley Engineering Ltd.
 Dings Magnetic Separator Co.
 Dorr-Oliver G.m.b.H.
 Dravo Corp.
 Eriez Mfg. Co.
 Filter Fabrics, Inc.
FRASER & CHALMERS ENGR.
WKS.
GENERAL ELECTRIC CO., LTD.,
THE
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON
FORGE LTD.
 Head Wrightson Colliery Engineer-
 ing Ltd.
HEWITT-ROBINS, INC.
 Hirsch Bros. Machine Co., Inc.
 Jeffrey Manufacturing Co.
 Kennedy-Van Saun Mfg. & Engr.
 Corp.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
 Link-Belt Co.
 Magnetic Engineering & Mfg. Co.
 McNally Pittsburgh Mfg. Co.
 Memco-see Magnetic Engineering
 & Mfg. Co.
MINE & SMELTER SUPPLY CO.,
Morse Bros. Mach. Co.
 Ore & Chemical Co.
 Osborne Laboratories, Inc. Ray-
 mond G.
 Rapid Magnetic Machines, Ltd.
 Simplicity Engineering Co.
SOUTHWESTERN ENGR. CO.
 Stearns Magnetic, Inc.
STEARNS-ROGER MFG. CO., THE
 Tennant Sons & Co., C., of N.Y.
WEDAG
WEMCO MOBILE-MILL-SEE
WESTERN MACHINERY CO.
WESTERN MACHINERY CO.
 Wilnot Eng. Co.
 Yuba Consolidated Industries, Inc.

ION EXCHANGE EQUIPMENT
ALLIS-CHALMERS MFG. CO.
 Dorr-Oliver G.m.b.H.
 Inflico, Inc.
 Permutit Co., The
STEARNS-ROGER MFG. CO., THE

FANNING

Carpco Mfg. Co.
 Ion Exchange Equipment
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
DENVER EQUIPMENT CO.
DORR-OLIVER INC.
HACK ENGINEERING CO.
 Inflico, Inc.
 PETERSON FILTERS & ENGI-
 NEERING CO.
SOUTHWESTERN ENGINEERING
CO.
STANDARD STEEL CORP.
STEARNS-ROGER MFG. CO.
TYLER CO., W. S.
 Universal Dredge Mfg. Co.
WESTERN MACHINERY CO.

JIGS

Bavaria Maschinenfabrik
 Bendelari, F. N.
 Cœur d'Alene Hardware & Foundry
 Co.
DENVER EQUIPMENT CO.
 Dorr-Oliver G.m.b.H.
FRASER & CHALMERS ENGR.
WKS.
GENERAL ELECTRIC CO., LTD.,
THE
 Head Wrightson Colliery Engineer-
 ing Ltd.
 Hirsch Bros. Machy. Co.
 I. H. C. Holland
 Jeffrey Manufacturing Co.
 Kennedy-Van Saun Mfg. Co.
 Knapp & Bates, Ltd.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
KRUPP, FRIED-MASCHINEN
UND STAHLBAU RHEIN-
HAUSEN
 Link-Belt Co.
MCANAHAN & STONE CORP.
 McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO.
 Miners Foundry & Mfg. Co.
 Morse Bros. Machinery Co.
 Powermatic Drill & Tool Co.
 Stokes & Co. Ltd., R.O.
 Universal Dredge Mfg. Co.
WEDAG
WEMCO-REMER-SEE WESTERN
MACHY. CO.
WESTERN MACHY. CO.
 Wilnot Eng. Co.
 Yuba Mfg. Div.

SPIRAL CONCENTRATORS

Birtley Engineering Ltd.
DENVER EQUIPMENT CO.
FRASER & CHALMERS ENGR.
WKS.
GENERAL ELECTRIC CO., LTD.,
THE
 Hirsch Bros. Machine Co., Inc.
 Humphreys Investment Co.
 Jeffrey Mfg. Co.
WEDAG

TABLES

Bavaria Maschinenfabrik
**BUCKMAN TILING CONCEN-
 TRATOR-SEE DENVER**
EQUIP. CO.
 Carpo Mfg., Inc.
**CONCENCO-SEE DEISTER CON-
 CENTRATOR CO., THE**
 Davies Magnet Works Ltd.
DEISTERPLAT-O-SEE DEISTER
CONCENTRATOR CO.
DEISTER CONCENTRATOR CO.
 Deister Machine Co.
DENVER EQUIPMENT CO.
 Dushan Mfg. & Sales Co., Gordon S.
FRASER & CHALMERS ENGR.
WKS.
GENERAL ELECTRIC CO. OF
ENGLAND, LTD.
 Hirsch Bros. Machine Co., Inc.
HOLMAN BROS. LTD.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
 Knapp & Bates, Ltd.
 Link-Belt Co., Export Div.
MINE & SMELTER SUPPLY CO.
 Minerals et Metaux
 Morse Bros. Machinery Co.
 Osborne Laboratories, Inc., Ray-
 mond G.
SUPER DUTY DIAGONAL-DECK
**-SEE DEISTER CONCEN-
 TRATOR CO.**
 Universal Dredge Mfg. Co.
WEDAG
**WILFLEY-SEE MINE & SMELT-
 ER SUPPLY CO., THE**
 Yuba Manufacturing Co.

CHEMICAL CONCENTRATORS

Inflico, Inc.
 Kennedy-Van Saun Mfg. & Co.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
 Knapp & Bates, Ltd.
 Davey Paxman & Co. Ltd.
 Snyder Mine & Chemical Lab.
STEARNS-ROGER MFG. CO.
WESTERN MACHY. CO.

CONCRETING EQUIPMENT, UNDERGROUND

See also Grouting
 Air Placement Equip. Co.
 Blaw-Knox Co.
 Cement Gun Co.
 Cementation Co. Ltd., The
 Chain Belt Co.
CHICAGO PNEUMATIC TOOL
CO.

Construction Mach. Co.
 Gunite-see Cement Gun Co.
 Jaeger Machine Co., The
 Mayo Tunnel & Mine Equip.
 Terkret G.m.b.H.

CONDITIONERS

See Agitators and Conditioners;
 Engine Exhaust Conditioners

CONDUIT

See Cable and Conduit

CONSTRUCTION, MINE PLANT

See Plant Design and Construc-
 tion

CONSULTING

METALLURGISTS

Booth Co., Inc., The
 Braun & Co., C. F.
BURBRIDGE-PYBURN CANNON
ASSOC., HARRY B.
 Carpo Manufacturing, Inc.
**DENVER EQUIPMENT COM-
 PANY**
 Electric Steel Foundry Co.
 Galigher Co.
 Gutehoffnungshute A.G.
ABBOTT HANKS, INC.
**HUMBOLDT, KLOCKNER-HUM-
 BOLDT-DEUTZ AG**
 Kaiser Engineers
 C. P. Keegel
 Knapp & Bates Limited
 Ledoux & Co.
 Liquid-Solid Separations Ltd.
LOTTTRIDGE-THOMAS & ASSOC.
 McDowell Co., Inc.
MESABI ENGINEERING
 Minerals Engineering Co.
SOUTHWESTERN ENGINEERING
CO.
STEARNS-ROGER MFG. CO., THE
 Talbot, H. L.
 Universal Dredge Mfg. Co.
WOLFE & ASSOC.

CONSULTING MINING ENGINEERS

BOYLES BROS. DRILLING CO.
BURBRIDGE-PYBURN CANNON
ASSOCIATES, HARRY B.
 Carpo Manufacturing, Inc.
CHAPMAN, WOOD & GRISWOLD
COWIN & CO., INC.
 Corwin Co., Inc.
DALE WADE M.
 Davis & Davis
 Earle, Norton K.
 Frederick Francis H. & Associates
 Geo-Engineering
GOULD & CO., GORDON I.
 Gutehoffnungshute, AG
HACK ENGINEERING CO.
 Head Wrightson Colliery Engineer-
 ing Ltd.
 Heinrichs Geoprospection Co.
HEWITT-ROBINS, INC.
 Hirsch Bros. Machine Co., Inc.
**INDUSTRIAL PHYSICS & ELEC-
 TRONICS CO.**
 Ingersoll, Guy E.
 Kaiser Engineers
 Kane, Wm. G.
 C. P. Keegel
 Link-Belt Co.
 Linta, Mark
LONGYEAR CO., E. J.
 Loebnour, R. L.
LOTTTRIDGE, THOMAS & ASSOC.
MACAFEE & CO.
 McMillan, W. D.
MESABI ENGINEERING
 Miller, Arnold H.
 Minerals Engineering Co.
 O'Donnell & Schmidt
 Pens Associates
 Pierce, Roger V.
 Pinger, Allen W.
 Schaefer & Associates, F. C.
 Scheidenhelm, F. W.

Schroter & Lockwood, Inc.
 Sherman, Howard P.
SOUTHWESTERN ENGINEERING
CO.
STEARNS-ROGER MFG. CO., THE
STILL & STILL
 Thomas, Conrad W.
 Turner & Associates
 Earl C. Van Horn
 Vulcan Iron Works Co.
 Westinghouse Electric Corp.
WISSER & COX
HARRY J. WOLF
 Wilson Exploration Co.
WOLFE & ASSOC.
 World Mining Consultants Inc.

CONTINUOUS MINERS

Doaco Overseas Engineering Ltd.
 Goodman Mfg. Co.
 Jeffrey Mfg. Co.
JOY MFG. CO.
 Joy-Sullivan Ltd.
 National Mine Service Co.
 Westinghouse Air Brake Co., Le
 Roi Div.

CONTROLS

See also Gauges and Scales

ELECTRIC MOTOR

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
 Louis Allis Co., The
ASEA, SWEDEN
 Carpo Mfg. The
 Daystrom-Weston Sales Div.,
 Daystrom Inc.
 E C & M Div. of Square D Co.
FRASER-CHALMERS ENGR. WKS.
 Gardner, Ralph C., & Co.
 Gen. Electric Co., Apparatus Sales
 Div.
GENERAL ELECTRIC CO. LTD.
GRAYBAR ELECTRIC CO., INC.
**INDUSTRIAL PHYSICS & ELEC-
 TRONICS CO.**
LEEDS & NORTHRUP, CO.
 M & C Switchgear, Ltd.
 Micro Switch
 Reliance Electric and Engineering
 Co.
 Shepard Niles Crane & Hoist Corp.
 Wadsworth Elec. Mfg. Co., Inc.
 Westinghouse Electric Corp.

ELECTRONIC

ABCs Scale Div., The McDowell Co.
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES LTD.
 Bristol Co., The
 Bruce Peebles & Co., Ltd.
 Cooper-Bessemer Corp., The
 Daystrom-Weston Sales Div.,
 Daystrom, Inc.
 English Drilling Equip. Co.
 Foxboro Co., The
 General Electric Co., Apparatus
 Sales Div.
GENERAL ELECTRIC CO. LTD.
GRAYBAR ELECTRIC CO., INC.
 Howe Scale Co.
 Hyson Mfg. Co.
 Industrial Nuclears Corp.
**INDUSTRIAL PHYSICS & ELEC-
 TRONICS CO.**
 Leeds & Northrup Co.
 Mine Safety Appliances Co.
 Reliance Electric and Engineering
 Co.
 Research-Cottrell, Inc.
 Richardson Scale Co.
 Westinghouse Electric Corp.

HYDRAULIC

AMERICAN BRAKE SHOE CO.
AMERICAN BRAKE SHOE CO.,
EXPORT DIV.
BLACK'S MINING EQUIP., LTD.
 Bristol Co.
 Commercial Shearing & Stamping
 Co., Inc.
 Conflow, Ltd.
**HOLMAN BROS. LTD. (ENG-
 LAND)**
 Hycan Mfg. Co.
**INDUSTRIAL PHYSICS & ELEC-
 TRONICS CO.**
 Inflico, Inc.
 Stenberg Mfg. Co.
 Telehoist Ltd.

MILL

ABCs Scale Div., The McDowell Co.
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
 Analytical Measurements, Inc.
 Beckman Instruments, Inc., Scien-
 tific Instruments Div.

Conveyors & Elevators

Bendix Aviation Corp.
Bristol Co., The
Euclid Electric & Mfg. Co.
Fischer & Porter Co.
General, Ralph C. & Co.
General Electric Co., Apparatus Sales Div.

INDUSTRIAL PHYSICS & ELECTRONICS CO.

Inflico, Inc.
Leeds & Northrup Co.
Link-Belt Co.
MASSCO-ADAMS-SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
Norwood Controls Unit.
Philadelphia Gear Works, Inc.
Reliance Electric & Engineering Co.
Westinghouse Electric Corp.

PNEUMATIC

ABCs Scale Div., The McDowell Co.
Leeds & Northrup Co.
English Drilling Equip. Co.
Foxboro Co., The
GARDNER-DENVER CO.
HOLMAN BROS. LTD. (ENGLAND)

Inflico, Inc.
Leeds & Northrup Co.
INDUSTRIAL PHYSICS & ELECTRONICS CO.
Minneapolis-Honeywell Regulator Co.
Westinghouse Air Brake Co., Industrial Prods. Div.

HYDROMETALLURGICAL

ABCs Scale Division, McDowell Co., Inc.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Barber-Colman Co., Wheeler Instruments Div.
Bristol Co., The
Foxboro Co., The
General Electric Co., Apparatus Sales Div.
INDUSTRIAL PHYSICS & ELECTRONICS CO.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co.

CONVERTERS

See Electrical Equipment; Pyrometallurgical Equipment; Transmissions

CONVEYOR EQUIPMENT

See also Scales

BELTS

AMERICAN BRAKE SHOE CO.
American Biltrite Rubber Co., Boston Woven Hose & Rubber Co.
American Rubber Mfg. Co.
AMSCO-SEE AMERICAN BRAKE SHOE CO.
Barber-Greene Co.
Becker-Prunte, G.m.b.H.
Bischoff-Werke, K. G.
Bonded Scale & Machine Co.
Boston Woven Hose & Rubber Co.
BRITISH ROPEWAY ENGINEERING CO. LTD.
Butler Manufacturing Company
Cable Belt, Ltd.
Carlyle Rubber Co., Inc.
Chain Belt Co.
Simon Carves Ltd.
Continental Conveyor & Equip. Co.
Conveyor Co., The
Davison & Co. (Hutchinson) Ltd.
Demag Aktiengesellschaft
Diamond Iron Works, Div. Goodman Mfg. Co.
Eickhoff, Gebr. Maschinenfabrik u. Eisengiesserei G.m.b.H.
EQUIPMENT ENG. INC.
FRASER & CHALMERS ENGR. WKS.
Gates Rubber Co.
GOODALL RUBBER CO.
Goodrich Rubber Co.
GOODRICH CO., B. F., INDUSTRIAL PROD. DIV.
Goodyear Tire & Rubber Co.
GOODYEAR INTERNATIONAL CORP.
Gründler Crusher & Pulverizer Co.
Gutehoffnungshütte, AG
HACK ENG. CO., Inc., Geo.
H. E. Mining Engineering Co. Ltd.
HEWITT-ROBINS INC.
Howe Scale Co.
INTERNATIONAL B. F. GOODRICH
International Combustion (Export) Ltd.
Iowa Manufacturing Co.
Jeffrey Mfg. Co., The

Joy-Sullivan Ltd.
Kennedy-Van Saun Mfg. & Eng. Corp.
KLOCKNER-HUMBOLDT-DEUTZ, A. G.
Korb-Pettit Wire Fabrics & Iron Wks., Inc.

Lee Rubber & Tire Corp., Repable Rubber Div.

Link-Belt Co.
Magnetic Engineering & Mfg. Co.
Mavor & Coulson, Ltd.
Mayo Tunnel & Mine Equipment
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.

NATIONAL MINE SERVICE CO.
Ogden Iron Works Co.
Pioneer Engineering, Div. of Poor & Co.

Pohlig, J., A. G.
Porter Co., H. K., Quaker Rubber Co., Div.

Quaker Pioneer Rubber Mills
Quaker Rubber Co.—see Porter Co., H. K.
Raybestos-Manhattan, Inc.
Ray-man—see Raybestos-Manhattan Co.

Republie Rubber Div., Lee Rubber & Tire Corp.
Richardson Scale Co.
Rubber Improvement Ltd.
Smith Engineering Works
Sprout, Waldron & Co., Inc.
Stephens-Adams Mfg. Co.
Stubbs, Albert

Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Thermoid Co.
Thiele, August G.m.b.H.
THOR POWER TOOL CO.
TREADWELL CO., INC., M. H.
Turner Bros. Asbestos Ltd.
U. S. Rubber Co.
United States Rubber Intl.
U. S. STEEL EXPORT CO.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Western Foundry Co.
Yuba Manufacturing Div.

BUCKETS

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.

AMERICAN BRAKE SHOE CO., EXPORT DIV.
Barber-Greene Co.
Bonded Scale & Machine Co.
Butler Manufacturing Company
Chain Belt Co.
Christian Engineers, J. D.
COLUMBIA STEEL CASTING CO., INC.

Continental Conveyor & Equip. Co.
Conveyor Co., The
DENVER EQUIPMENT COMPANY
EQUIPMENT ENG. INC.
GENERAL ELECTRIC CO. OF ENGLAND, LTD.

Gründler Crusher & Pulverizer Co.
HACK ENG. CO.
HEWITT-ROBINS, INC.
Hirsch Bros. Machine Co., Inc.
International Combustion Products Ltd.

Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
Jeffrey Manufacturing Co.
Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT-DEUTZ, A. G.
Koehring Co., Johnson Co., C. S., subid.

Link-Belt—see Link-Belt Co.
Lippmann Engineering Works
Magnetic Engineering & Mfg. Co.
Marcar & Co. Ltd., Alexander
McDowell Co., Inc.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.

NATIONAL IRON CO.
Ogden Iron Works
Pioneer Eng. Div., Poor & Co., Inc.
Rogers Iron Works Co.
Salem Tool Co.
Sanford-Day Iron Works, Inc.
Sprout, Waldron & Co., Inc.
Stephens-Adams Mfg. Co.
Stubbs, Albert
SUTCLIFFE LTD., RICHARD

Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Wilmot Engr. Co.
Yuba Manufacturing Div.

DRIVE AND TAIL PULLEYS

ACF Industries, Inc., American Car & Foundry Div.
AMERICAN BRAKE SHOE CO.
Barber-Greene Co.
British Jeffrey-Diamond Ltd.
Chain Belt Co.
Christian Engineers, J. D.
Continental Conveyor & Equip. Co.
Conveyor & Equip. Co.
Demag Aktiengesellschaft
Diamond Iron Works
Dowty Mining Equipment Ltd.
EQUIPMENT ENG., INC.
Dodge Manufacturing Corp.
GENERAL ELECTRIC CO. LTD., THE

Goodman Mfg. Co.
Gründler Crusher & Pulverized Co.
HACK ENGINEERING CO.
Hadfields Ltd.
Haisa Mfg. Co., Inc., Geo.
H. E. Mining Engineering Co. Ltd.
HEWITT-ROBINS, INC.
Iowa Manufacturing Co.
Jeffrey Manufacturing Co.
JOY MANUFACTURING CO.
Joy-Sullivan Ltd.
KLOCKNER-HUMBOLDT-DEUTZ, A. G.

Link-Belt Co.
Lippmann Engineering Works
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Mitchell Ropeways Ltd.
Ogden Iron Works Co.
Pioneer Engineering, Div. of Poor & Co., Inc.

Pohlig, J., A. G.
Rogers Iron Works Co.
SKOOKUM CO., INC., THE
Smith Engineering Works
Sprout, Waldron & Co., Inc.
Stearns Magnetic Products
Stephens-Adams Mfg. Co.
Stubbs, Albert

RICHARD SUTCLIFFE, LTD.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
TREADWELL CO., INC., M.H.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Mach. Co.
Western Foundry Co.
Yuba Manufacturing Div.

IDLERS

AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.

AMSCO-SEE AMERICAN BRAKE SHOE CO.

Barber-Greene Co.
Bonded Scale & Machine Co.
British Jeffrey-Diamond Ltd.
Simon Carves Ltd.
Chain Belt Co.
Christian Engineers, J. D.
Continental Conveyor & Equip. Co.
Conveyor Co., The

Diamond Iron Works
EQUIPMENT ENG., INC.
Fisher & Ludlow, Ltd.
FRASER & CHALMERS ENGR. WORKS

GENERAL ELECTRIC CO. LTD., THE

Goodyear Tire & Rubber Co.
Gründler Crusher & Pulverizer Co.
HACK ENG. CO.
Haisa Mfg. Co., Inc., Geo.
HEWITT-ROBINS, INC.

H. E. Mining Engineering Co. Ltd.
Hirsch Bros. Machine Co., Inc.
International Combustion (Export) Ltd.

Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
Irwin Sensenich Corp.
Jeffrey Manufacturing Co.

JOY MANUFACTURING CO.
Joy-Sullivan Ltd.
Kennedy-Van Saun Mfg. & Engr. Corp.

LIMBEROLLER-SEE JOY MFG. CO.
Link-Belt Co.

Lippmann Engineering Co., E. F.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL CO.

Mitchell Ropeways Ltd.
Ogden Iron Works Co.
Pettibone Mulliken Corp.
Pioneer Engineering Div., Poor & Co., Inc.

Pohlig, J., A. G.
Sheepbridge Equip. Ltd.
Smith Engineering Works
Stephens-Adams Mfg. Co.
Stubbs, Albert

RICHARD SUTCLIFFE, LTD.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS
TREADWELL CO., INC., M. H.

Universal Dredge Mfg. Co.
Universal Engineering Corp.
Western Foundry Co.
Yuba Manufacturing Co.

PILLOW BLOCKS AND HANGERS
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.

Bonded Scale & Machine Co.
Simon Carves Ltd.
Chain Belt Co.

Christian Engineers, J. D.
Continental Conveyor & Equipment Co.

Conveyor Co., The
Dodge Manufacturing Corp.
EQUIPMENT ENG., INC.

GENERAL ELECTRIC CO. LTD., THE

General Motors Corp., New Departure Div.

Gründler Crusher & Pulverizer Co.
Hadfields Ltd.

Haisa Mfg. Co., Inc., Geo.
HEWITT-ROBINS, INC.
Hirsch Bros. Machine Co., Inc.

Iowa Manufacturing Co.
Jeffrey Manufacturing Co.
Link-Belt Co.

McNally Pittsburgh Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.

Ogden Iron Works Co.
S K F Industries, Inc.
Sealmaster—see Stephens-Adams Mfg. Co.

SKOOKUM CO.
STEPHENS-ADAMSON MFG. CO.

TELLURIDE IRON WKS.
Universal Engineering Corp.
Yuba Manufacturing Div.

CONVEYORS AND ELEVATORS

See also Feeders

BELT CONVEYORS
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.

American Rubber Mfg. Co.
Athey Products Corp.

Austin Hopkinson & Co. Ltd.
Aveling-Barford
Baker Perkins Ltd.

Barber-Greene Co.
Bonded Scale and Machine Co.
Boston Woven Hose & Rubber Co.

Broadbent, Robert & Son, Ltd.
Butler Mfg. Co.
Carlyle Rubber Co., Inc.

Carpeo Mfg. Inc.
Chain Belt Co.
Christian Engineers, J. D.

Continental Conveyor Equip. Co.
Conveyor Co., The
Demag Aktiengesellschaft
DENVER EQUIPMENT CO.

Diamond Iron Works, Div. Goodman Mfg. Co.
Eickhoff, Gebr. Maschinenfabrik u. Eisengiesserei G.m.b.H.
Equipment Engineering Co.
Erbo Maschinenbau

FRASER & CHALMERS ENGR. WKS.
GOODALL RUBBER CO.
Goodman Manufacturing Co.
GOODRICH CO., B. F. INDUSTRIAL PROD. DIV.

Manufacturers' Complete Names and Addresses are listed on the last pages of this yellow section. Advertisers in this issue are listed in boldface capital letters.

Coolers

HEWITT-ROBINS, INC. ROBINS CONVEYORS DIV.
Hirsch Bros. Machinery Co.
INTERNATIONAL B. F. GOOD-RICH

International Combustion (Export) Ltd.

Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
Irwin Sensenich Corp.
Jeffrey Manufacturing Co.
JOY MANUFACTURING CO.
Joy-Sullivan Ltd.
Kennedy-Van Saun Mfg. & Eng. Co.

KLOCKNER-HUMBOLDT-DEUTZ, A. G.

Kort-Pettit Wire Fabrics & Iron Works, Inc.

LAKE SHORE, INC.
Landis Steel Co.

Lee Rubber & Tire Corp., Republic Rubber Div.

LIBMEROPE-SEE JOY MFG. CO.

Link-Belt Co.

Lippmann Engineering Works

Magnetic Engineering & Mfg. Co.

Mayo Tunnel & Mine Equip.

McNally Pittsburgh Mfg. Co.

MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.

Miners Foundry & Mfg. Co.

Mitchell Ropeways Ltd.

Morse Bros. Machinery Co.

NATIONAL IRON CO.

NATIONAL MINE SERVICE CO.

Oliver Corp., The A. B. Farquhar Div.

Pettibone Mulliken Corp.

Pegson Ltd.

Pioneer Engineering Div., Poor & Co., Inc.

Pioneer Rubber Mills

Porter Co., Inc., H. E. Quaker Rubber Div.

Quaker Pioneer Rubber Mills

Quaker Rubber Co.

Raybestos-Manhattan, Inc.

READY-SPAN-SEE JOY MFG. CO.

Redi-Fab, see Barber-Greene Co.

Republic Rubber Div., Lee Rubber & Tire Corp.

Rex-see Chain Belt Co.

Richardson Scale Co.

Ropeways Ltd.

Rogers Iron Works Co.

SALZGITTER MASCHINEN

ARTENGESELLSCHAFT

Sheepbridge Equip. Ltd.

Smith Engineering Works

Stephens-Adamson Mfg. Co.

STURTEVANT MILL CO.

RICHARD SUTCLIFFE LTD.

TELLURIDE IRON WKS.

Thiele, August G.m.b.H.

Thermoid Co.

THOR POWER TOOL CO.

TREADWELL CO., INC., M. H.

Trowbridge-see Magnetic Engineering & Mfg. Co.

United States Rubber Co.

United States Rubber Intl.

U. S. STEEL EXPORT CO.

Universal Dredge Mfg. Co.

Universal Engineering Corp.

Washington Machinery Co.

WEDAG

Westfälische Maschinenbau G.m.b.H.

Wood & Co. Ltd., Hugh

Yosemite-see American Rubber Mfg. Co.

BUCKET ELEVATORS

AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.

AMSCO-SEE AMERICAN BRAKE SHOE CO.

Aveling-Barford

Barber-Greene Co.

Bonded Scale & Machine Co.

Butler Mfg. Co.

Carpco Mfg. Co.

Chain Belt Co.

Christian Engineers, J. D.

COLUMBIA STEEL CASTING CO., INC.

Continental Conveyor & Equipment Co.

Conveyor Co., The

Davison & Co. (Hexham) Ltd.

DENVER EQUIPMENT CO.

Diamond Iron Works, Div. Goodman Mfg. Co.

Equipment Engineering Co.

Galigher Co.

GENERAL ELECTRIC CO. OF ENGLAND, LTD.

Gruendler Crusher & Pulverizer Co.

HACK ENG. CO.

HEWITT-ROBINS, INC.

Hirsch Bros. Machinery Co.

I.H.C. Holland

INTERNATIONAL B. F. GOOD-RICH

International Combustion (Export) Ltd.

Iowa Manufacturing Co.

Jeffrey Manufacturing Co. The

Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT-DEUTZ, A. G.

Koehring Co., Johnson Co., C. E. a subsid.

LAKE SHORE, INC.

Landis Steel Co.

Link-Belt Co.

Lippmann Engineering Works

Magnetic Engineering & Mfg. Co.

McNahan & Stone

NATIONAL IRON CORP.

Oliver Corp., The A. B. Farquhar Div.

Pegson Ltd.

Pettibone Mulliken Corp.

Pioneer Engineering Div., Poor & Co., Inc.

Richardson Scale Co.

Rogers Iron Works Co.

Sheepbridge Equip. Co. Ltd.

Smith Engineering Works

Stephens-Adamson Mfg. Co.

STURTEVANT MILL CO.

RICHARD SUTCLIFFE, LTD.

Taylor-Wharton Iron & Steel Co.

TELLURIDE IRON WKS.

Thiele G.m.b.H., August

TREADWELL CO., INC., M. H.

Trowbridge-see Magnetic Engineering & Mfg. Co.

Universal Dredge Mfg. Co.

Universal Engineering Corp.

Watt Car & Wheel Co., The

WEDAG

Yuba Manufacturing Div.

CHAIN CONVEYORS

Baker Perkins Ltd.

Bonded Scale & Machine Co.

Chain Belt Company

Continental Conveyor & Equip. Co.

Conveyor Co., The

Equipment Engineering Co.

HACK ENGINEERING CO.

Hemscheidt Maschinenfabrik, Hermann

H. E. Mining Engineering Co. Ltd.

Hirsch Bros. Machine Co.

Hitachi, Ltd.

International Combustion (Export) Ltd.

Irwin Sensenich Corp.

Jeffrey Mfg. Co., The

Joy-Sullivan Ltd.

Kennedy-Van Saun Mfg. & Eng. Corp.

Link-Belt Co.

Mitchell Ropeways Ltd.

Morse Chain Co.

NATIONAL IRON CO.

Oliver Corp., The A. B. Farquhar Div.

Stephens-Adamson Mfg. Co.

RICHARD SUTCLIFFE LTD.

Thiele G.m.b.H., August

Universal Dredge Mfg. Co.

PNEUMATIC

Baker Perkins Ltd.

Convair, Inc.

Eries Manufacturing Co.

Fluor Hartman, Div. Fluor Products Co. Hartman A.G., Maschinenfabrik

Hirsch Bros. Machine Co., Inc.

Hitachi, Ltd.

HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ AG

Jeffrey Mfg. Co.

Kennedy-Van Saun Mfg. & Eng. Corp.

Spencer Turbine Co., The

Sturtevant Eng. Co. Ltd.

U.S. Hoffman Machinery Corp.

SCREW

AMSCO-SEE AMERICAN BRAKE SHOE CO.

Bonded Scale & Machine Co.

Carpco Mfg. Inc.

Simon Carves Ltd.

Chain Belt Co.

Coeur d'Alene Hardware & Foundry Co.

Continental Conveyor & Equipment Co.

Conveyor Co., The

Davison & Co. (Hexham) Ltd.

DENVER EQUIPMENT COMPANY

Equipment Engineering Co.

Gruendler Crusher & Pulverizer Co.

HACK ENGINEERING CO.

Hevi-Edge-see Christian Engineers, J. B.

Hirsch Bros. Machinery Co.

HOL-FLITE-SEE WESTERN PRECIPITATION CO.

Jeffrey Manufacturing Co.

Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT-DEUTZ, A. G.

Koehring Co., Johnson Co., C. E. a subsid.

Lippmann Engineering Works

Miners Foundry & Mfg. Co.

Pettibone Mulliken Corp.

Pioneer Engr. Div., Poor & Co. Inc.

Rex-see Chain Belt Co.

Richardson Scale Co.

STURTEVANT MILL CO.

Taylor-Wharton Iron & Steel Co.

TELLURIDE IRON WKS.

Universal Dredge Mfg. Co.

Universal Engineering Corp.

Washington Machinery Co.

Watt Car & Wheel Co., The

WEDAG

SHAKING OR VIBRATING

Bonded Scale & Machine Co.

Chain Belt Company

Cleveland Vibrator Co., The

Continental Gin Co.

Dravo Corp.

FLOTTMANN-WERKE G.M.B.H.

FRASER & CHALMERS

GENERAL ELECTRIC CO., LTD., THE

Goodman Manufacturing Co.

Gruendler Crusher & Pulverizer Co.

HACK ENG. CO.

H. E. Mining Engineering Co. Ltd.

HEWITT-ROBINS, INC.

Hirsch Bros. Machine Co., Inc.

Internatl Combustion (Export) Ltd

Jeffrey Manufacturing Co.

Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT-DEUTZ, A. G.

Link-Belt Co.

Lippmann Engineering Works

Overstrom & Sons

Richardson Scale Co.

Scott's Concentrators

Sheepbridge Equip. Ltd.

Simplex Engr. Co.

SMITH & CO., F. L.

Stahlwerke Brunighaus G.m.b.H.

Stephens-Adamson Mfg. Co.

Syntron Co.

TELLURIDE IRON WKS.

Universal Dredge Mfg. Co.

Universal Engineering Corp.

Vulcan Iron Wks., Inc.

Watt Car & Wheel Co., The

WEDAG

STEEL PLATE

Baker Perkins Ltd.

Becker-Prunte G.m.b.H.

Bonded Scale & Machine Co.

GENERAL ELECTRIC CO. LTD.

Guthoffnungsschutte A.G.

HACK ENGINEERING CO.

Hemscheidt Maschinenfabrik, Hermann

Hirsch Bros. Machine Co., Inc.

HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ A. G.

I. H. C. Holland

Jeffrey Mfg. Co.

Kennedy-Van Saun Mfg. & Eng. Corp.

Link-Belt Co.

Marcar & Co. Ltd., Alexander

Rogers Iron Works

Sheepbridge Equip. Ltd.

RICHARD SUTCLIFFE LTD.

Thiele G.m.b.H., August

Universal Dredge Mfg. Co.

WEDAG

Westfälische Maschinenbau G.m.b.H.

Wharton Engineers, Ltd.

KLOCKNER-HUMBOLDT-DEUTZ, A. G.

Link-Belt Co.

Nichols Engineering & Research Corp.

NORDBERG MFG. CO.

Pacific Foundry Co., Ltd.

SMITH & CO., F. L.

SOUTHWESTERN ENGINEERING CO.

STANDARD STEEL CORP.

STEARNS-ROGER MFG. CO.

Surface Combustion Corp.

TAYLOR ENGR. & MFG. CO.

The Visco Engr. Co.

Washington Machinery Co.

WESTERN PRECIPITATION CORP.

Windeler Co., Ltd., George

COOLERS, MINE

Carrier Corp.

COOLING TOWERS

See also Dryers and Kilns

Bethlehem Steel

Carrier Corp.

COUPLINGS

See also Transmissions

HOSE

ATLAS COPCO AB, SWEDEN
ATLAS COPCO INC.
Band-It Co.
Boston Woven Hose & Rubber Co.
CHICAGO PNEUMATIC TOOL CO.
Chiksan Co.
Cleveland Div., Westinghouse Air Brake Co.
Consolidated Pneumatic Tool Co., Ltd.
GATES RUBBER CO.
GOODALL RUBBER CO.
GOODYEAR INTERNATIONAL CORP.
HEWITT-ROBINS, INC.
HOLMAN BROS. LTD.
Hose Accessories Co., Le-Hi Div. Ideal Corp.
INGERSOLL-RAND CO.
INTERNATIONAL B. F. GOODRICH
Le Hi Champ—see Hose Accessories Co.
Lincoln Engineering Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Pioneer Rubber Mills
Punch-Lok Co.
Snap-Tite, Inc.
Stewart-Warner Corp.
Thermoid Co.
THOR POWER TOOL CO.
Trabon Engineering Corp.
U. S. Rubber Co.
U. S. Rubber Intl.

PIPE

ATLAS COPCO AB, SWEDEN
ATLAS COPCO INC.
Band-It Co.
Bethlehem Steel
Chiksan Co.
The Colonial Plastics Mfg. Co.
FOOD MACHINERY & CHEM. CORP., JOHN BEAN DIV.
GOODALL RUBBER CO.
Grinnell Co., Inc.
Gustin-Bacon Mfg. Co.
International Coupler Co.
INTERNATIONAL B. F. GOODRICH
Johns-Manville Sales Corp.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
National Supply Co. (Pa.)
PACIFIC PIPE CO.
Snap-Tite, Inc.
Taylor Forge & Pipe Works
THOR POWER TOOL CO.
U. S. Rubber Co.
Victaulic Co. of America
Walworth Co.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.

SHAFT & SHAFT FLEXIBLE

Airflex—see Falk Corp., The
BROWN, INC., DAVID
Brown Corp. (Sales) Ltd., David
Chain Belt Co.
Continental Gin Co.
Diamond Chain Co., Inc.
Dodge Mfg. Corp.
Falk Corp., The
Farrel-Birmingham Co., Inc.
HEWITT-ROBINS, INC.
Jeffrey Manufacturing Co.
Koppers Co., Inc., Metal Prods. Div.
Link-Belt Co.
Morse Chain Co.
Philadelphia Gear Wks., Inc.
Thomas Flexible Coupling Co.
Twin Disc Clutch Co.
Western Gear Corp.
Wigglesworth & Co. Ltd., Frank

CRANES

BRIDGE

Allison Steel Mfg. Co.
American Chain & Cable Co.
Wright Hoist Div.
American Hoist & Derrick Co., Crosby—Laughlin Div.
American M.A.N. Corp.
Demag Aktiengesellschaft
Dravo Corp.
HACK ENGINEERING CO.
HARNISCHFEGGER CORP.
Heyl & Patterson, Inc.
Hitachi, Ltd.
I.H.C. Holland
John Deere Industrial Div.
Mannesmann Export G.m.b.H.
MARION POWER SHOVEL CO.
McDowell Co., Inc.

Ohio Hoist & Mfg. Co.
Pitman Manufacturing Co.
Robbins & Myers, Inc.
Schoonmaker Co., Inc., P. G.
Shepard Niles Crane & Hoist Corp.
STEARNES-ROGER MFG. CO.
Thunes Mek. Verkatet, A. S.
United States Steel Corp.
Universal Dredge Mfg. Co.
Wellman Engineering Co., The
Yuba Mining Div. Yuba Consolidated Industries, Inc.

JIB

ALIMAK VERKEN A/B
American Chain & Cable Co., Wright Hoist Div.
American Hoist & Derrick Co., Crosby—Laughlin Div.
American M.A.N. Corp.
Austin-Western & Lima A. W. BALDWIN - LIMA - HAMILTON CORP.
Clyde Iron Wks., Inc.
Demag Aktiengesellschaft
HACK ENGINEERING CO.
HARNISCHFEGGER CORP.
Hitachi, Ltd.
I.H.C. Holland
LE TOURNEAU-WESTINGHOUSE CO.
MARION POWER SHOVEL CO.
Ohio Hoist & Mfg. Co.
Robbins & Myers, Inc.
Shepard Niles Crane & Hoist Corp.
Smith & Sons (Rodley) Ltd. Thos.
Thunes Mek. Verkatet, A. S.
Universal Dredge Mfg. Co.
Vaughan Crane Co., Ltd.
Yuba Mining Div.

TRUCK or TRACTOR MOUNTED

ALLIS-CHALMERS MFG. CO., CONST. MACH. DIV.
American Hoist & Derrick Co., American M.A.N. Corp.
Augsburg-Nurnberg AG, Maschinenfabrik (M.A.N.)
BALDWIN-LIMA-HAMILTON CORP.
Bucyrus Erie Co.
CLARK EQUIP. CO., CONSTRUCTION MACH. DIV.
Clyde Iron Wks., Inc.
COLES, see Steel & Co. Ltd.
Crane Mobile—see Bay City Shovels, Inc.
Demag Aktiengesellschaft
Drott Mfg. Corp.
Four Wheel Drive Auto Co., The
Gar Wood Industries, Inc.
HARNISCHFEGGER CORP.
HEAD-WRIGHTSON STOCKTON FORGE, LTD.
HIAB—SEE STANCO MFG. & SALES, INC.
Hitachi, Ltd.
Hyster Co.
I.H.C. Holland
INTERNATIONAL HARVESTER EXPORT CO.
INTERNATIONAL SUPERIOR—SEE INTERNATIONAL HARVESTER EXPORT CO.
Koehring Co.
LE TOURNEAU-WESTINGHOUSE ERIE CO.
Link-Belt Speeder Corp.
LIMA—SEE BALDWIN-LIMA-HAMILTON CORP.
Lorain—see Thew Shovel Co.
Manitowoc Eng. Corp.
Mannesmann Export G.m.b.H.
MARION POWER SHOVEL CO.
Merton Engineering Co., Ltd.
MICHIGAN—SEE CLARK EQUIPMENT CO.
MotoCranes—see Thew Shovel Co.
Northwest Eng. Co.
Ohio Hoist & Mfg. Co.
Pettibone Mulliken Corp.
Pitman Manufacturing Co.
Quick Way Truck Shovel Co.
Schield Bantam Co.
Service Supply Corp.
Shepard Niles Crane & Hoist Corp.
Smith & Sons (Rodley) Ltd., Thos.
STANCO MFGS. & SALES, INC.—PRIESTMAN BROS. LTD.
Stenberg Corp. of Canada Ltd.
Thew Shovel Co.
Tiedt—see Stenberg Corp. of Canada, Ltd.
Transit Crane—see Bucyrus-Erie Co.
TOURNAPULL—SEE LE TOURNEAU-WESTINGHOUSE CO.

Unit Crane & Shovel Corp.
Washington Iron Works

CRUSHER PARTS

(Other than primary crusher manufacturers below)
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ALLOY STEEL & METALS CO.
AMERICAN MANGANESE STEEL DIV., AMERICAN BRAKE SHOE CO.
AMERICAN BRAKE SHOE CO., EXPORT DIV.
Bohler Bros. & Co. Ltd.
COLUMBIA STEEL CASTING CO., INC.
Crusher Eng. Div., Poor & Co.
Electric Steel Foundry Co.
Gründler Crusher & Pulverizer Co.
Gutehoffnungshutte A.G.
Hadfields Ltd.
HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ AG
Iowa Mfg. Co.
Jeffrey Mfg. Co., The
Pettibone Mulliken Corp.
Taylor-Wharton Iron & Steel Co.

JAWS & CHEEK PLATES

Birdsboro Corp.
Electric Steel Foundry Co.
Kennedy-Van Saun Mfg. & Eng. Corp.
NATIONAL MALLEABLE & STEEL CASTINGS CORP.
Sheepbridge Equip. Ltd.
WEDAG

CRUSHERS

See also Laboratory Equipment and Supplies; Pulverizers

CONE

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bath Iron Wks. Corp.
Coeur d'Alene Hardware & Foundry Co.
Electric Steel Foundry Co.
FRASER & CHALMERS
GENERAL ELECTRIC CO. LTD., THE
Gutehoffnungshutte A.G.
HYDROCONE—SEE ALLIS-CHALMERS MFG. CO.
Kennedy-Van Saun Mfg. & Eng. Corp.
KLOCKNER-HUMBOLDT-DEUTZ A.G.
Lippmann Eng. Works, Inc.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
NORDBERG MANUFACTURING CO.
Pegson Ltd.
Pennsylvania Crusher Co.
Smith Engineering Works
Sheepbridge Equip. Ltd.
Straub Manufacturing Co., Inc.
STURTEVANT MILL CO.
SYMONS—SEE NORDBERG MANUFACTURING CO.
Universal Engineering Corp.
WEDAG

DISK

Electric Steel Foundry Co.
Hadfields Ltd.
Sheepbridge Equip. Ltd.

GYRATORY

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bath Iron Wks. Corp.
Electric Steel Foundry Co.
GENERAL ELECTRIC CO. OF ENGLAND LTD.
Gutehoffnungshutte A.G.
Hadfields Ltd.
Hitachi, Ltd.
Kennedy-Van Saun Mfg. & Eng. Corp.
Kueken—see Straub Mfg. Co., Inc.
Armstrong Whitworth (Metal Ind.) Ltd.
KLOCKNER-HUMBOLDT-DEUTZ A.G.

Lippmann Engineering Works
MASSCO—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
NORDBERG MFG. CO.
Pegson Ltd.
Pennsylvania Crusher Co.
Sheepbridge Equip. Ltd.
Smith Engineering Works
SOUTHWESTERN ENGINEERING CO., SWECO VIBRO-ENERGY MILLS
Sturtevant Eng. Co. Ltd.
STURTEVANT MILL CO.
SUPERIOR—SEE ALLIS-CHALMERS MFG. CO.
SYMONS—SEE NORDBERG MANUFACTURING CO.
TRAYLOR ENGR. & MFG. CO.
WEDAG

HAMMER AND IMPACT

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Athy Prod. Corp.
Aveling-Barford
Bath Iron Wks.
Baxter, Ltd.
Bradford-Breaker—see Penn. Crusher Co.
Combustion Engineering, Inc., Raymond Div.
Crusher Eng. Div., Poor & Co.
Diamond Iron Works, Div. Goodman Mfg. Co.
Eagle Crusher Co.
Electric Steel Foundry Co.
FRASER & CHALMERS
GENERAL ELECTRIC CO. LTD., THE
Gründler Crusher & Pulverizer Co.
Gutehoffnungshutte A.G.
HAZEMAG OF GERMANY—SEE HAZEMAG USA, INC.
Hitachi, Ltd.
International Combustion (Export) Ltd.
Iowa Manufacturing Co.
Jeffrey Manufacturing Co.
JOY MFG. CO.
Joy-Sullivan Ltd.
Kennedy-Van Saun Mfg. & Eng. Corp.
KLOCKNER-HUMBOLDT-DEUTZ A.G.
Knittel—see Stephens-Adamsen Mfg. Co.
KRUPP, FRIED. MASCHINEUN UND STAHLBAU RHEINHAUSEN
Lippmann Engineering Works
Mudhoe—see Jeffrey Manufacturing Co., The
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
NORDBERG MFG. CO.
Pegson Ltd.
Pennsylvania Crusher Co.
Pioneer Eng. Div., Poor & Co., Inc.
Pettibone Mulliken Corp.
Pulva Corp.
PulvaSizer—see Pulva Corp.
PULVERATOR CO.—SEE ALLIS-CHALMERS MFG. CO.
Rogers Iron Works Co.
Simplicity Engineering Co.
Sprout, Waldron & Co., Inc.
Stephens Adamsen Mfg. Co.
Sturtevant Eng. Co. Ltd.
STURTEVANT MILL CO.
SYMONS—SEE NORDBERG MFG. CO.
Thunes Mek. Versted, A. S.
Universal Engineering Corp.
Universal—see Pettibone Mulliken Corp.
WEDAG
Williams Crusher & Pulverizer Co.
Wolf, Buckau & R (Maschinenfabrik) A.G.

JAW

A-1—SEE ALLIS-CHALMERS MFG. CO.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ALLOY STEEL & METALS CO.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Aveling-Barford
BALDWIN-LIMA-HAMILTON CORP.
Bath Iron Wks. Corp.
Baxter, Ltd., W. H.
Bleo, Inc.
Birdsboro Corp.
Bonded Scale & Machine Co.
Broadbent, Robert & Son, Ltd.
Crusher Eng. Div., Poor & Co.
DFC—SEE DENVER FIRE CLAY CO., THE
DENVER EQUIP. CO.
DENVER FIRE CLAY CO.
Diamond Iron Works, Div. Goodman Mfg. Co.

Manufacturers' Complete Names and Addresses are listed on the last pages of this yellow section. Advertisers in this issue are listed in boldface capital letters.

Cyclones

Eagle Crusher Co.
Electric Steel Foundry Co.
Farrel-Bacon—see Farrel-Birmingham Co.
Farrel-Birmingham Co., Inc.
FRASER & CHALMERS
GENERAL ELECTRIC CO. LTD.

THE
Gründler Crusher & Pulveriser Co.
Guthoffnungshutte A.G.
Hadfield Ltd.
Hitachi, Ltd.
Iowa Manufacturing Co.
Jeffrey Manufacturing Co.
Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT-DEUTZ A. G.
Kue-ken—see Straub Mfg. Co., Inc.
Armstrong-Whitworth (Metal Ind.) Ltd.
Lippmann Engineering Works

MADSEN—SEE BALDWIN-LIMA-HAMILTON CORP.
MASSCO—SEE MINE & SMELTER SUPPLY CO.

McLANAHAN & STONE CORP.
MINE & SMELTER SUPPLY CO.
Morgendhamms Mek. Verkstads A.B.
Morse Bros. Machinery Co.

NORDBERG MFG. CO.
PACIFIC—SEE ALLOY STEEL & METALS CO.
Parker, Ltd., Frederick

Pegson, Ltd.
Pennsylvania Crusher Co.
Pettibone Mulliken Corp.
Pioneer Engr. Div. Poor & Co., Inc.

Reliance—see Universal Road Machinery Co.
Rogers Iron Works Co.

Sheepbridge Equip. Co. Ltd.
Smith Engineering Works
Straub Manufacturing Co., Inc.

Sturtevant Eng. Co. Ltd.
STURTEVANT MILL CO.
SYMONS—SEE NORDBERG MFG. CO.

Texas Gulf Sulphur Co.
TRAYLOR ENGINEERING & MFG. CO.

Universal—see Pettibone Mulliken Corp.
Universal Engineering Corp.

Universal Road Machinery Co.
Vickers-Armstrongs (Engineers) Ltd.

WEDAG
Westfälische Maschinenbau G.m.b.H.

ROLL

ACF Industries, Inc., American Car & Foundry Div.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP

AMSCO—SEE AMERICAN BRAKE SHOE CO.
Austin-Western (See Baldwin-Lima-Hamilton Corp.)

Aveling-Barford
BALDWIN-LIMA-HAMILTON CORP.

Bath Iron Wks. Corp.
Birdsboro Corp.
Bonded Scale & Machine Co.

Combustion Engineering Inc.—Raymond Div.
Crusher Eng. Div. Poor & Co.

Davison & Co. (Michigan) Ltd.
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO., THE

Diamond Iron Works.
Div. Goodman Mfg. Co.
Electric Steel Foundry Co.

Exolon Co., The
FAIRMONT—SEE ALLIS CHALMERS MFG. CO.

Flexroll—See Jeffrey Manufacturing Co.
FRASER & CHALMERS
GENERAL ELECTRIC CO. LTD., THE

Gründler Crusher & Pulveriser Co.
Gundlach Machine Co., T. J.
Hadfield Ltd.

Hitachi, Ltd.
Iowa Manufacturing Co.
International Combustion (Export) Ltd.

Jeffrey Manufacturing Co.
Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT-DEUTZ A. G.
Link-Belt Co.

Lippmann Engineering Works
McLANAHAN & STONE CORP.
McNally Pittsburgh Mfg. Co.

MINE & SMELTER SUPPLY CO., THE MARY MILL DIV.
J.K.
Morse Bros. Machinery Co.

Osborne Lab., Inc. Raymond G.
Pegson Ltd.
Pennsylvania Crusher Co.

Pettibone Mulliken Corp.

Pioneer Engr. Div., Poor & Co., Inc.

Pulva Corporation.
Rogers Iron Works Co.

Sheepbridge Equip. Ltd.
Smith Engineering Works
Stephens-Adamson Mfg. Co.

Sturtevant Eng. Co. Ltd.
STURTEVANT MILL CO.
TRAYLOR ENGINEERING & MFG. CO.

Union Iron Works Co.
Universal—see Pettibone Mulliken Corp.

Vulcan Patent Wks. Co. (Pa.)
WEDAG
Williams Patent Crusher & Pulverizer Co.

Willmot Eng. Co.

CYCLONES

See also Classifiers

Allison Steel Mfg. Co.
American Air Filter Co., Inc.

Birtley Engineering Ltd.
Buell Eng. Co., Inc.
CENTRICLONE—SEE DORR-OLIVER, INC.

Centrifugal & Mechanical Industries, Inc.
Combustion Engineering Inc. (Raymond Div.)

DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
DORRCLONE—SEE DORR-OLIVER, INC.

Ducon Co.
EQUIPMENT ENGINEERS INC.
FRASER & CHALMERS ENG. WORKS

GENERAL ELECTRIC CO. OF ENGLAND, LTD.
HARDINGE CO., INC.
HAZEMAG U.S.A., INC.

Head Wrightson Colliery Engineering Ltd.
Heyl & Patterson, Inc.

Hirsch Bros. Machine Co., Inc.
Johnson March Corp.
Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT-DEUTZ A. G.
Liquid Solid Separations Ltd.

NORTHERN BLOWER CO.
PETERSON FILTERS & ENGINEERING CO.

STANDARD STEEL CORP.
Sturtevant Eng. Co. Ltd.
TELLURIDE IRON WORKS CO.

WESTERN MACHY. CO.
Wilkinson Rubber Linatex, Ltd.
Williams Patent Crusher & Pulverizer Co.

Willmot Eng. Co.

Wilmot Eng. Co.

CYLINDERS AND

ACTUATORS

Bethlehem Steel
Commercial Shearing & Stamping Co.

Hemacheidt Maschinenfabrik, Hermann
HOLMAN BROS LTD.
Walter Kidd & Company, Inc.

Leden Mfg. Co.
McDowell Co., Inc.
Telehoist Ltd.

Wellman Engineering Co., The
Westinghouse Air Brake Co., Cleveland Rock Drill Div.

Westinghouse Air Brake Co., Inc.
Industrial Products Div.

Westinghouse Air Brake Co., Inc.
Industrial Products Div.

DIAMOND BIT RESETTING

ACKER DRILL CO., INC.
American Coldset Corp.

ANTON SMIT & CO. INC.
CHRISTENSEN DIAMOND PRODUCTS CO.

Crælius Company Ltd.
DIAMOND DRILL CONTRACTING CO.
HOFFMAN—SEE STANCO

JOY MFG. CO.
Joy-Sullivan Ltd.
McCLINTOCK CO., R. S.

Mobile Drilling, Inc.
SMIT & CO. INC., ANTON Smit & Sons (Diamond Tools) Ltd., J.K.

STANCO MFGS. & SALES, INC.
L. M. Van Moppes & Sons, Ltd.
VAREL DIAMOND PROD.

VAREL MFG. CO.
Wheel Trusing Tool Co.

DIAMOND DRILL

EQUIPMENT

See also BITS; DRILLS, ROCK

ACKER DRILL CO., INC.
American Coldset Corp.

BOYLES BROS. DRILLING CO., LTD. (Canada)
CHICAGO PNEUMATIC TOOL CO.

CHRISTENSEN DIAMOND PRODUCTS CO.
Core Storage Equip., see Tomco

Products Co.
Crælius Company Ltd.
DIAMOND DRILL CONTRACTING CO.

Drilling Accessory & Mfg. Co., Ltd.
English Drilling Equip. Co. Ltd.
Falling Co., George E.

GARDNER-DENVER CO.
HOFFMAN—SEE STANCO
JOY MANUFACTURING CO.

Joy-Sullivan Ltd.
LONGYEAR CO., E. J.
McCLINTOCK CO., R.S.

Mobile Drilling, Inc.
Pennsylvania Drilling Co.
SALZGITTER MASCHINEN A. G.

SMIT & CO. INC., ANTON
SPRAGUE & HENWOOD, INC.
STANCO MFGS. & SALES, INC.

Thom Ltd., John
Tomco Products Co.
L. M. Van Moppes & Sons, Ltd.

VAREL MFG. CO.
Wheel Trusing Tool Co.
Winter-Weiss Co., The

DIAMOND DRILLING

See Exploration Services

DIAMOND DRILLS

See Drills, Rock

DIAMONDS, INDUSTRIAL

See also Diamond Bit Resetting

Service
American Coldset Corp.

Carboloy—see General Electric Co., Metallurgical Products Dept.

CHRISTENSEN DIAMOND PRODUCTS CO.
Coldset—see American Coldset Corp.

DIAMOND TOOL RESEARCH CO., INC.
General Electric Co., Metallurgical

Products Dept.
GENERAL ELECTRIC CO., INTERNATIONAL
Havlic Diamond Drilling Co., Inc.

Koebel Diamond Tool Co.
LONGYEAR, E. J. CO.
McCLINTOCK COMPANY, R.S.

SMIT & CO. INC., ANTON
Smit & Sons, Inc., J. K.

Smit & Sons (Diamond Tools) Ltd., J.K.
Snyders Mine & Chemical Lab.

SPRAGUE & HENWOOD, INC.
Van Moppes & Sons, Ltd., L. M.

VAREL DIAMOND PRODUCTS CO.
Wheel Trusing Tool Co.

DIPPERS

See Buckets

DOORS, MINE

AMERICAN MINE DOOR COMPANY
CANTON—SEE AMERICAN MINE DOOR COMPANY

Coeur d'Alene Hardware & Foundry Co.
Gregg Co., Ltd.

Guthoffnungshutte A.G.
Hemacheidt, Hermann
NATIONAL MINE SERVICE CO.

DRAFTING SUPPLIES

See Engineering

Supplies and Drafting Equipment

DRAGLINES

See Excavators

DREDGES AND

DREDGE BUCKETS

CONNECTED BUCKETLINE

AMERICAN MANGANESE STEEL DIV., AMERICAN BRAKE SHOE CO.

AMERICAN BRAKE SHOE CO., EXPORT DIV.
COLUMBIA STEEL CASTING CO., INC.

CONSTRUCTION AGGREGATES (DREDGING CONTRACTORS)
Dravo Corp.

ELLICOTT MACHINE CORP.
HACK ENGINEERING CO.
Hadfield Ltd.

I.H.C. Holland
McDowell Co., Inc.
Morris Machine Works

Ruston-Bucyrus, Ltd.
Taylor-Wharton Iron & Steel Co.
Universal Dredge Mfg. Co.

Washington Iron Works
Wellman Eng. Co. Williams Bucket Divan.

Yuba Mining Div.

CUTTERHEAD (Hydraulic)

see also Monitors
AMERICAN MANGANESE STEEL DIV., AMERICAN BRAKE SHOE CO.

AMERICAN BRAKE SHOE CO., EXPORT DIV.
American Hoist & Derrick Co.,

Crosby-Laughlin Div.
American Steel Dredge Co., Inc.
AMSCO—SEE AMERICAN BRAKE SHOE CO.

CONSTRUCTION AGGREGATES (DREDGING CONTRACTORS)
Eagle Iron Works

Electric Steel Foundry Co.
ELLICOTT MACHINE CORPORATION
HACK ENG. CO.

I.H.C. Holland
Morris Machine Works
Taylor-Wharton Iron & Steel Co.

Universal Dredge Mfg. Co.
Yuba Mining Div.

DRAGLINE DREDGE

AMERICAN MANGANESE STEEL DIV., AMERICAN BRAKE SHOE CO.

American Hoist & Derrick Co.
CONSTRUCTION AGGREGATES (DREDGING CONTRACTORS)
Electric Steel Foundry Co.

HACK ENG. CO.
Hadfield Ltd.
Maddox Foundry & Machine Works

McDowell Co., Inc.
Page Engr. Co.
Taylor-Wharton Iron & Steel Co.

Universal Dredge Mfg. Co.
Washington Iron Works
Wellman Engineering Co., The

Yuba Mining Div.

DRIFTERS

See Drills, Rock

DRILLING CONTRACTORS

See Exploration Services

DRILL SHARPENERS

See Sharpeners, Rock Bit

DRILL STEEL

See Steel

DRILLS, ROCK

See also Diamond Drill Equipment

AUGER DRILLS

ACKER DRILL COMPANY, INC.
ATLAS COPCO AB., SWEDEN
Carboloy—see General Electric Co.,

Metallurgical Products Dept.
Cardox Corp., Hardsog Div.
Central Mine Equipment Co.

Consolidated Pneumatic Tool Co., Ltd.
English Drilling Equipment Co.

Falling Co., Geo. E.
Firth Sterling, Inc.
GARDNER-DENVER CO.

General Electric Co., Metallurgical Products Dept.

Drills, Rock

General Equipment Co.
Hausherr, Rudolf & Son G.m.b.H.
HOLMAN BROS. LTD.
Kerfmaster—see Central Mine
Equipment Co.
Le Grand Sutcliffe & Gell Ltd.
LONGYEAR, E. J. CO.
Mayhew Supply Co.
McCarthy—see Salem Tool Co., The
Mobile Drilling Inc.
**SVENSKA MOTORBORR AB (SEE
MOTORAMIC, INC.)**
Powermite Drill & Tool Co.
Rogers Iron Works Co.
Salem Tool Co., The
THOR POWER TOOL CO.
Vascoloy-Ramet Corp.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Wood & Co. Ltd., Hugh
Worthington Corp.

CHURN DRILLS

Bucyrus-Erie Co.
Craellus Company Ltd.
GARDNER-DENVER CO.
Rogers Iron Works Co.
General Electric Co., Carboly Dept.
Hillman Co., Inc., C. Kirk
Hossfeld Mfg. Co.
Le Grand Sutcliffe & Gell Ltd.
LONGYEAR, E. J. CO.
Mills Iron Works, Inc.
Mobile Drilling Inc.
Ruston-Bucyrus Ltd.
**SALZGITTER MASCHINEN
AKTIENGESSELLSCHAFT
SPANG & CO.**

CRAWLER-MOUNTED DRILLS

ALIMAK-VERKEN AB
**ATLAS COPCO—SEE ATLAS DIE-
SEL, A. B. SWEDEN**
ATLAS COPCO INC.
Bucyrus-Erie Co.
**CHICAGO PNEUMATIC TOOL
CO.**
Consolidated Pneumatic Tool Co.
Ltd.
Davy Compressor Co.
Drilling Accessory & Mfg. Co., Inc.
Failing Co., Geo. E.
GARDNER-DENVER CO.
Halifax Tool Co. Ltd.
HOLMAN BROS. LTD.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Machinery Center, Inc.
Mayhew Supply Co.
Mobile Drilling Inc.
Porta-Drill—see Winter Weiss Co.,
The
Reich Bros. Mfg. Co.
**REICHDRILL DIV., CHICAGO
PNEUMATIC TOOL CO.**
Reichdrill Mfg. Co., Ltd.
Ruston-Bucyrus Ltd.
Salem Tool Co.
**SALZGITTER MASCHINEN
AKTIENGESSELLSCHAFT**
THOR POWER TOOL CO.
TRACDRILL—SEE JOY MFG. CO.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Roi Div.
Winter Weiss Co., The
Wood & Co. Ltd., Hugh

DIAMOND DRILLS

ACKER DRILL COMPANY, INC.
American Coldset Corp.
Atomic Eng. Corp.
BOYLES BROS. DRILLING CO.
Boyles Bros. Drilling Co., Ltd.
(Canada)
Bucyrus Erie Co.
**CHICAGO PNEUMATIC TOOL
CO.**
Consolidated Pneumatic Tool Co.
Ltd.
Craellus Company Ltd.
**DIAMOND DRILL CONTRACT-
ING CO.**
Drilling Accessory & Mfg. Co., Inc.
Du Jac Mfg. Co.
English Drilling Equip. Co. Ltd.
Failing Co., Geo. E.
General Electric Co., Carboly Dept.
Hermann Von Rautenkranz
Holeycat—see Atomic Eng. Corp.
Hitchcock, Leo L.
JOY MANUFACTURING CO.
Joy-Sullivan Ltd.
Junction Bit & Tool Co.
Koebel Diamond Tool Co.
LONGYEAR, E. J. CO.
MCCLEINTOCK CO., R.S.
Metal Carbides Corp.
Moab Drilling Co.
Mobile Drilling Inc.
Morgardshammars Mek. Verkskads
A.B.

Penn-drill—see Pennsylvania Drill-
ing Co.
Pennsylvania Drilling Co.
Port-O-Power—see Hitchcock Mfg.
Co., Leo
**SMIT & CO. INC., ANTON SMIT
& SONS, J.K., INC.**
SPRAGUE & HENWOOD, INC.
STANCO MFG. SALES, INC.
**SUPER PIONEER—SEE DIA-
MOND DRILL CONTRACTING
CO.**
TELLURIDE IRON WKS.
Tomeco
Van Moppes & Sons Ltd., L.M.
VAREL MFG. CO.
Wheel Tracing Tool Co.
Wink Corp.
Winter-Weiss Co., The

DOWN HOLE

Bohler Bros. & Co. Ltd.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co.
Ltd.
Failing Co., George E.
GARDNER-DENVER CO.
Halifax Tool Co. Ltd.
HOLMAN BROS. LTD.
INGERSOLL-RAND CO.
JOY MFG. CO.
Joy-Sullivan Ltd.
Le Roi Div., Westinghouse Air
Brake Co.
MACHINERY CENTER, INC.
Mobile Drilling, Inc.
Powermite Drill & Tool Co.
**REICHDRILL DIV., CHICAGO
PNEUMATIC TOOL CO.**
Schramm Inc.
THOR POWER TOOL CO.
Winter-Weiss Co., The

DRIFTERS

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO INC.
**CHICAGO PNEUMATIC TOOL
CO.**
Consolidated Pneumatic Tool Co.,
Ltd.
Dagenhardt-Utsch K.G.
Demag Aktiengesellschaft
FLOTTMANN G.M.B.H.
GARDNER-DENVER CO.
Hardypick, Ltd.
Hauhinco Maschinenfabrik
Hausherr, Rudolf & Son G.m.b.H.
HOLMAN BROS. LTD.
Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Joy-Sullivan Ltd.
Le Roi Div., Westinghouse Air
Brake Co.
Marcar & Co. Ltd., Alexander
Schramm Inc.
**SILVER STREAK—SEE JOY
MFG. CO.**
THOR POWER TOOL CO.
Turbo Maschinen A. G.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Roi Div.
Worthington Corp.

GASOLINE DRILLS AND HAMMERS

ACKER DRILL CO.
ATLAS COPCO INC.
ATLAS COPCO, A. B. SWEDEN
Barco Mfg. Co.
Carpo Mfg. Co.
**CHICAGO PNEUMATIC TOOL
CO.**
Craellus Company, Ltd.
General Equipment Co.
Hossfeld Manufacturing Co.
**PIONJAR—SEE STANCO MFG. &
SALES, INC.**
Porto Drill Co.
Powermite Drill & Tool Co.
STANCO MFG. & SALES, INC.
Stenberg Corp. of Can. Ltd.
Svenska Motorbör AB.
Syntron Co.

JET PIERCING DRILLS

Bucyrus Erie Co.
Carpo Mfg. Inc.
Linde Air Prod. Co.
Union Carbon & Carbide Corp.,
Linde Air Products Co., Div.

JUMBO AND BOOM ASSEMBLIES

See also Self Loading Transport
ALIMAK-VERKEN AB
ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO INC.
**CHICAGO PNEUMATIC TOOL
CO.**
Consolidated Pneumatic Tool Co.,
Ltd.
GARDNER-DENVER CO.
Glamo—see Sanford Day Iron Wks.
HOLMAN BROS. LTD.
**HYDRO DRILL JIB—SEE JOY
MANUFACTURING CO.**
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Joy-Sullivan Ltd.
Landis Steel Co.
MACHINERY CENTER, INC.
Mayo Tunnel & Mine Equip. Co.
Mobile Drilling Inc.
Rogers Iron Works Co.
Sanford Day Iron Wks.
Shaft & Development Machines,
Inc.
THOR POWER TOOL CO.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Roi Div.
Winter-Weiss Co., The

ROTARY DRILLS

ACKER DRILL COMPANY, INC.
Augsburg-Nurnberg A. G., Masch-
inenfabrik (M.A.N.)
Bedford & Sons Ltd., John
Bohler, Gehr. & Co. A.G.
Bucyrus-Erie Co.
Carpco Corp.
CHAMPION—SEE JOY MFG. CO.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co.,
Ltd.
Dagenhardt-Utsch A.G.
Davy Compressor Co.
Drilling Accessory Mfg. Co., Inc.
English Drilling Equipment Co.
Failing Co., George E.
Firth Sterling, Inc.
FLOTTMANN-WERKE G.M.B.H.
GARDNER-DENVER CO.
General Electric Co., Carboly Dept.
Hardypick Ltd.
Hauhinco Maschinenfabrik
Hemsheldt, Hermann
Hitchcock Mfg. Co., Leo
HOLMAN BROS. LTD.
Failing Co., Geo. E.
Hurricane—see Mayhew Supply Co.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air
Brake Co.
LONGYEAR, E. J. CO.
Marcar & Co. Ltd., Alexander
Mayhew Supply Co.
Mills Iron Works, Inc.
Moab Drilling Co.
Mobile Drilling Inc.
National Supply Co. (Pa.)
Pandril—see Pennsylvania Drill-
ing Co.
Pennsylvania Drilling Co.
Porta-Drill—see Winter-Weiss Co.,
The
Powermite Drill & Tool Co.
Reich Bros. Mfg. Co.
**REICHDRILL DIV., CHICAGO
PNEUMATIC TOOL CO.**
Reichdrill Mfg. Co. Ltd.
Rogers Iron Works Co.
**SALZGITTER MASCHINEN
AKTIENGESSELLSCHAFT**
Schramm Inc.
**SMIT & CO. INC., ANTON
SPRAGUE & HENWOOD, INC.**
Star Expansion Pacific, Inc.
Thom Ltd. John
THOR POWER TOOL CO.
VAREL MFG. CO.
Vascoloy-Ramet Corp.
Westinghouse Air Brake Co. (Pa.)
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Winter-Weiss Co., The

ROTARY, PERCUSSIVE

ATLAS COPCO AB, SWEDEN
ATLAS COPCO INC.
Bohler Bros. & Co. Ltd.
Broom & Wade Ltd.
CHICAGO PNEUMATIC TOOL CO.

Consolidated Pneumatic Tool Co., Ltd.

Failing Co., George E.
FLOTTMANN-WERKE G.M.B.H.
GARDNER-DENVER CO.
Hitchcock Mfg. Co., Leo
HOLMAN BROS. LTD.
INGERSOLL-RAND CO.
JOY MFG. CO.
Joy-Sullivan Ltd.
LeGrand Sutcliffe & Gell Ltd.
Mobile Drilling, Inc.
Reichdrill Mfg. Co. Ltd.
**REICHDRILL DIV., CHICAGO
PNEUMATIC TOOL CO.**
Schramm, Inc.
**SMIT & CO. INC., ANTON
RICHARD SUTCLIFFE LTD.**
THOR POWER TOOL CO.
Victor Products Ltd.
Winter-Weiss Co., The

SHOT DRILLS

ACKER DRILL COMPANY, INC.
Gardner Corp.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co.
Ltd.
Craellus Company Ltd.
Davy Compressor Co.
Drilling Accessory & Mfg. Co., Inc.
English Drilling Equipment Co.
Failing Co., George E.
GARDNER-DENVER CO.
Hardypick Ltd.
Mayhew Supply Co.
Moab Drilling Co.
Mobile Drilling, Inc.
Pennsylvania Drilling Co.
Reich Bros. Mfg. Co. Inc.
Reichdrill Mfg. Co. Ltd.
**SALZGITTER MASCHINEN
AKTIENGESSELLSCHAFT**
SPRAGUE & HENWOOD, INC.
Westinghouse Air Brake Co. (Pa.)
Winter-Weiss Co., The

SINKERS

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO INC.
**CHICAGO PNEUMATIC TOOL
CO.**
Consolidated Pneumatic Tool Co.,
Ltd.
Davy Compressor Co.
Demag Aktiengesellschaft
FLOTTMANN G.M.B.H.
GARDNER-DENVER CO.
Hardypick Ltd.
Hausherr, Rudolf & Son G.m.b.H.
Hemsheldt, Hermann Maschinen-
fabrik
**HOLMAN BROS. LTD. (ENG-
LAND)**
Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air
Brake Co.
Powermite Drill & Tool Co.
Schramm Inc.
**SILVER STREAK—SEE JOY
MFG. CO.**
SPANG & CO.
THOR POWER TOOL CO.
Turbo-Maschinen A.G.
Westinghouse Air Brake Co., Le
Roi Div.

STOPERS

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO INC.
**CHICAGO PNEUMATIC TOOL
CO.**
Consolidated Pneumatic Tool Co.,
Ltd.
Dagenhardt-Utsch K. G.
Demag Aktiengesellschaft
Firth Sterling, Inc.
FLOTTMANN G.M.B.H.
GARDNER-DENVER CO.
Hardypick Ltd.
Hauhinco Maschinenfabrik
Hausherr, Rudolf & Son G.m.b.H.
**HOLMAN BROS. LTD. (ENG-
LAND)**
Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
TELLURIDE IRON WKS.
THOR POWER TOOL CO.
Turbo-Maschinen A. G.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Roi Div.

TRUCK-MOUNTED

ALIMAK-VERKEN AB
ACKER DRILL CO., INC.
Atomic Eng. Corp.
Blast Air-Joy Mfg. Co.
Boyles Bros. Drilling Co. Ltd.
(Canada)
CHICAGO PNEUMATIC TOOL CO.

**Manufacturers' Complete Names and Ad-
dresses are listed on the last pages of this
yellow section. Advertisers in this issue
are listed in boldface capital letters.**

Drives

Consolidated Pneumatic Tool Co. Ltd.
Copeo Mfg. Co.
Davy Compressor Co.
Drilling Accessory & Mfg. Co., Inc.
Failing Co., Geo. E.
Four Wheel Drive Auto Co., The
GARDNER-DENVER CO.
HOLMAN BROS. LTD.
INGERSOLL-RAND CO.
JOY MFG. CO.
LeGrand Sulfite & Gell, Ltd.
LONGYEAR CO., E. J.
MACHINERY CENTER INC.
Mayher Supply Co.
Mobile Equipment Inc.
National Supply Co. (Pa.)
Powermite Drill & Tool Co.
Reich Bros. Mfg. Co.
REICHDRILL DIV., CHICAGO
PNEUMATIC TOOL CO.
Reichdrill Mfg. Co. Ltd.
Ruston-Bucyrus Ltd.
SALZGITTER MASCHINEN
AKTIENGESSELLSCHAFT
Schramm, Inc.
SPRAGUE & HENWOOD, INC.
STANCO MFG. & SALES CO.
Thom Ltd., John
THOR POWER TOOL CO.
Westinghouse Air Brake Co., Le
Roy Div.
Westinghouse Air Brake Co. (Pa.)
Willis Motors, Inc.
Winter-Welch Co., The

WAGON DRILLS

ALIMAK-VERKEN AB
ATLAS COPCO, A. B., SWEDEN
ATLAS COPCO INC.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co. Ltd.
Deutscher Aktiengesellschaft
Drilling Accessory & Mfg. Co., Inc.
Firth Sterling Inc.
GARDNER-DENVER CO.
Hauscherr, Rudolf & Son G.m.b.H.
HOLMAN BROS LTD (ENG-
LAND)
Holman Bros. (Canada) Ltd.
Hosefield Manufacturing Co.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Joy-Sullivan Ltd.
Junction Bit & Tool Co.—
Le Roy Div. Westinghouse Air Brake
Co.
SALZGITTER MASCHINEN
AKTIENGESSELLSCHAFT
Schramm, Inc.
Thom Ltd., John
THOR POWER TOOL CO.
Westinghouse Air Brake Co., Le Roy
Div.
Worthington Corp.

DRIVES

See Also Shaft-Mounted Drives,
Gears; Open Gearing

CHAIN

AMERICAN BRAKE SHOE CO.
AMERICAN MANGANESE
STEEL DIV.
Bonded Scale & Machine Co.
Chain Belt Co.
Conveyor Co., The
Dodge Mfg. Corp.
B. F. GOODRICH CO., INDUS-
TRIAL PROD.
Hirsch Bros. Machy. Co.
Ideal—see National Supply Co.,
(Pa.)
Iowa Mfg. Co.
Jeffrey Manufacturing Co.
Kennedy-Van Saun Mfg. & Eng.
Corp.
Link-Belt Co.
Morse Chain Co.
NATIONAL IRON CO.
National Supply Co. (Pa.)
Rex—see Chain Belt Co.
Taper-Lock—see Dodge Mfg. Corp.
Thiele, August, G.m.b.H.
U.S. Rubber Co.
Yuba Mining Co.

FLANGE-MOUNTED DRIVE

Dodge Mfg. Corp.
Falk Corp.
Foots Bros.
FLATBELT
American Rubber Mfg. Co.
Continental Gin Co.
GATES RUBBER CO., THE
GOODYEAR INTERNATIONAL
CORP.
HAZEMAG OF GERMANY
Hirsch Bros. Machy. Co.
INTERNATIONAL B. F. GOOD-
RICH
Iowa Mfg. Co.
Link-Belt Co.

NATIONAL IRON CO.
National Supply Co. (Pa.)
Quaker Pioneer Rubber Mills
U. S. Rubber Co.
U. S. Rubber Intl.
Western Gear Wks.
Yuba Mining Co.

FLUID

Dodge Mfg. Corp.
Fluidrive Eng. Co., Ltd.
Telehoist Ltd.
Twin Disc Clutch Co.

SCREW CONVEYOR

Dodge Mfg. Corp.
Falk Corp.
Foots Bros.

VARIABLE SPEED

ALLIS-CHALMERS MFG. CO.
Louis Allis Co., The
DAVID BROWN, INC.
David Brown Industries Ltd.
The Cleveland Worm & Gear Co.
Dodge Mfg. Corp.
Electric Machinery Mfg. Co.
Fluidrive Eng. Co., Ltd.
GATES RUBBER CO., THE
General Dynamics Corp., Electro
Dynamic Div.
HEWITT-ROBINS, INC.
Leeds & Northrup Co.
Morse Chain Co.
Reeves Pulley Co., Div. Reliance
Elec. & Eng. Co.
Reliance Electric and Engineering
Co.
Sterling Electric Motors
RICHARD SUTCLIFFE LTD.
Telehoist Ltd.
U.S. Electrical Motors, Inc.
Varicon, see David Brown Ind., Ltd.
VICKERS-ARMSTRONGS LTD.
Western Gear Corp. (Calif.)
Wigglesworth Co. Ltd., Frank

V-BELT

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
Louis Allis Co., The
Bonded Scale & Machine Co.
Continental Gin Co.
Conveyor Co., The
Dodge Mfg. Co.
GATES RUBBER CO., THE
GOODRICH CO., B. F., INDUS-
TRIAL PROD. DIV.
GOODYEAR INTERNATIONAL
CORP.
HAZEMAG OF GERMANY
HEWITT-ROBINS, INC.
Hirsch Bros. Machy. Co.
INTERNATIONAL B. F. GOOD-
RICH
Iowa Mfg. Co.
Kennedy-Van Saun Mfg. & Eng.
Corp.
Link-Belt Co.
MAGIC GRIP—SEE ALLIS-CHAL-
MERS MFG. CO.
NATIONAL IRON CO.
National Supply Co. (Pa.)
Quaker Pioneer Rubber Mills
Reeves Pulley Co.
Taper-Lock—see Dodge Mfg. Co.
U. S. Rubber Co.
U. S. Rubber Intl.
Western Gear Wks.
Wigglesworth & Co. Ltd., Frank
Worthington Corp.
Yuba Mining Co.

DRIVES, GEAR

See Gears

DRYERS AND KILNS

See also Sintering Machines;
Coolers

ALLIS-CHALMERS MFG. CO.
INDUSTRIES GROUP
American Locomotive Co.
Barber-Greene Co.
Bethlehem Steel
Bird Machine Co.
Booth Co., Inc., The
Booth Concentrate Dryer—see Booth
Co., Inc., The
Carpco Mfg. Inc.
Carrier Conveyor Corp.
Centrifugal & Mechanical Indus-
tries, Inc.
Christian Engineers, J. D.
Combustion Engineering Inc., Ray-
mond Div.
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO., THE
DORR-OLIVER, INC.
Dravo Corp.
Electric Steel Foundry Co.

General American Transportation
Corp.
General Machinery Co.
GOULD & CO., GORDON I.
Gutehoffnungshutte A.G.
HACK ENGINEERING CO.
Hariver, Walter
HARDINGE CO., INC.
HAZEMAG OF GERMANY—SEE
HAZEMAG USA, INC.
HEAD WRIGHTSON STOCKTON
FORGE
Hirsch Bros. Machine Co., Inc.
Hevi-Duty Electric Co.
Heyl & Patterson, Inc.
Hold-Flite—see Christian Engineers,
J. D.
HOLO-FLITE — SEE WESTERN
PRECIPITATION CORP.
Inflico, Inc.
Iowa Manufacturing Co.
Kennedy-Van Saun Mfg. & Eng.
Corp.

KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
Link-Belt Co.
Luesche, Germany
LURGI GMBH
MCLEANAHAN & STONE CORP.
MINE & SMELTER SUPPLY CO.
Nichol, Engineering & Research
Corp.
NORDBERG MFG. CO.
Pacific Foundry Co., Ltd.
Parry Dryer—see Silver Engineer-
ing Co.
Pollock Co., The William B.
Silver Engineering Co.
SKINNER—SEE MINE & SMEL-
TER SUPPLY CO.
SMITH & CO., F. L.
STANDARD STEEL CORP.
STEARNS-ROGER MFG. CO.
Surface Combustion Corp.
TELLURIDE IRON WKS.
TRAYLOR ENG. & MFG. CO.
Universal Dredge Mfg. Co.
Vickers Armstrongs (Engineers)
Ltd.
Vulcan Iron Works, Pa.
Washington Machinery Co.
WESTERN PRECIPITATION
CORP.
Yuba Mining Div., Yuba Consoli-
dated Industries, Inc.

DUMPERS, MINE CAR

Allison Steel Mfg. Co.
ATLAS COPCO AB, SWEDEN
ATLAS COPCO INC.,
Bethlehem Steel
E. Boydell & Co. Limited
CARD IRON WORKS CO., THE
C. S.
Coeur d'Alene Hardware & Foundry
Connellsville Mfg. & Mine Supply
Co.
Differential Steel Car Co.
GARDNER-DENVER CO.
Gutehoffnungshutte, A.G.
Gottwald, Leo
GETTMAN BROS. MFG. DIVSN.
Greer Co. Ltd., The
Hemscheidt, Hermann
Heyl & Patterson, Inc.
Hirsch Bros. Machine Co., Inc.
Hitachi, Ltd.
Carl Kaebler
Irwin Sensenich Corp.
Kar-Flu—see Link-Belt Co.
Koebering Co.
LAKE SHORE INC.
Link-Belt Co.
McDowell Co., Inc.
McNally Pittsburgh Co.
Messrs. Fodens Ltd., Elworth Works
Miners Foundry & Mfg. Co.
Nolan Co., The
Pacific Car & Foundry Co.
Rogers Iron Wks.
TELLURIDE IRON WORKS
Sanford Day Iron Works, Inc.
Sheepbridge Equip. Ltd.
U.S. Steel
UNITED STATES STEEL EX-
PORT CO.
Wellman Engineering Co.

DUST COLLECTION

EQUIPMENT

Aeroturn—see Koppers Co. Inc.,
Metal Prod. Div.
American Air Filter Co., Inc.
American Blower Div. of American
Standard
Barber-Greene Co.
Bethlehem Steel
Buell Engineering Co., Inc.
CEAG
Combustion Engineering Inc., Ray-
mond Div.

Consolidated Pneumatic Tool Co.,
Ltd.
Convair, Inc.
COTTRELL — SEE WESTERN
PRECIPITATION CORP.
DUALAIRE — SEE WESTERN
PRECIPITATION CORP.
Ducon Co.
Dustube—see Wheelabrator Corp.
Failing Co., George E.
FRASER & CHALMERS
GENERAL ELECTRIC CO. LTD.,
THE
HAZEMAG OF GERMANY—SEE
HAZEMAG USA, INC.
Hirsch Bros. Machine Co., Inc.
HOLMAN BROS. MACHINE CO.,
INC.
Iowa Manufacturing Co.
Johnson March Corp.
JOY MFG. CO.
Joy-Sullivan Ltd.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
Koppers Co. Inc., Metal Prod. Div.
Martindale Electric Co.
Microdyne—see Joy Mfg. Co.
Mine Safety Appliances Co.
MULTICLONE — SEE WESTERN
PRECIPITATION CORP.
National Filter Media Corp.
NORBLU — SEE NORTHERN
BLOWER CO., THE
NORTHERN BLOWER CO., THE
Research Cottrell, Inc.
Sly Mfg. Co., The W. W.
Spencer Turbine Co., The
Standard Filterbau G.m.b.H.
STANDARD STEEL CORP.
Sturtevant Eng. Co. Ltd.
STURTEVANT MILL CO.
THOR POWER TOOL CO.
Torit Manufacturing Co.
Hayward Tyler & Co.
The Visco Eng. Co.
U. S. Hoffmann Machinery Corp.
WEDAG
WESTERN PRECIPITATION
CORP.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Roy Div.
Westinghouse Electric Corp.
Wheelabrator Corp.

ELECTRICAL EQUIPMENT

See also Magnetic Equip-
ment; Locomotives; Batteries;
Chargers; Welding Equipment;
Supplies and Services; Hoisting
Equipment; Communications;
Winches; Cable and Conduit

CABLE AND CONDUIT

See Cable and Conduit

INSTRUMENTS

See Controls; Recorders

LIGHT PLANTS

A. E. C. Limited
ALLIS-CHALMERS MFG. CO.,
ENGINE—MATERIAL HAN-
DLING DIV.
American M.A.R.C.
American Locomotive Co.
Caterpillar Tractor Co.
Cummins Engine Co., Inc.
Fairbanks, Morse & Co.
General Electric Co., Apparatus
Sales Div.
GENERAL ELECTRIC CO., INT'L.
GENERAL ELECTRIC CO. OF
ENGLAND, LTD.
GM DIESEL—SEE GENERAL
MOTORS OVERSEAS OPERA-
TIONS
GENERAL MOTORS OVERSEAS
OPERATIONS
GRAYBAR ELECTRIC CO., INC.
HARNISCHFGER CORP.
Hobart Bros. Co.
Homelite Corp.
JOY MANUFACTURING CO.
Kohler Co.
Lister-Blackstone, Inc.
Lynco Powerhouse—see Lynn
Engr. & Supply Co.
Minneapolis-Moline Co.
Motor Generator Corp.
NORDBERG MFG. CO.
Onan & Sons, Inc., D. W.
Power-Lite—see Lynn Eng. Co.
Schoonmaker Co., Inc., P. G.
Sheppard Co., R. H.
STEARNS-ROGER MFG. CO.
THOR POWER TOOL CO.
Westinghouse Electric Corp.
White Motor Co., Diesel Engine Div.
Witte Engine Works, Oil Well
Supply Div.

MOTORS, GENERATORS, AND CONVERTERS

ABEM Company
Allis Co., The Louis
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ASEA ELECTRIC, INC.
ASEA, SWEDEN
 Brown Boverie & Cie, A.G.
 Bruce Peebles & Co., Ltd.
 Carrier Corp.
 Caterpillar Tractor Co.
 Connecticut Telephone & Electric Corp.
DELCO—SEE GENERAL MOTORS OVERSEAS OPERATIONS
 Eaton Manufacturing Co.
 Electric Machinery Mfg. Co.
 Enterprise Engine & Machinery Co.
 Electro-Motive Div., Gen. Motors Corp.
 Fairbanks, Morse & Co.
 General Dynamics Corp., Electro Dynamic Div.
 General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
GENERAL ELECTRIC CO. OF ENGLAND, LTD.
 General Motors Corp., Delco Products Div.
 GM Corp., Detroit Diesel Engine Div.
GENERAL MOTORS OVERSEAS OPERATIONS
GRAYBAR ELECTRIC CO., INC.
 Greenwood & Batley Ltd.
HARNISCHFEGGER CORP.
 Hitachi, Ltd.
 Homelite Div., Textron, Inc.
 Howell Electric Motors Co.
 Carl Kaelble A.G.
 Kato Engineering Co.
 Lancashire Dynamo & Crypto Ltd.
 Lima Electric Motor Co., The
 Lincoln Electric Co.
 Line-weld—see Lincoln Elec. Co.
 Linde Air Products Co.
 Master Electric Co., The
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
 R & M—see Robbins & Myers, Inc.
 Reliance Electric & Engineering Co.
 Robbins & Myers, Inc.
 Schoonmaker Co., Inc., P. G.
 Sheppard Co., Inc., The R. H.
 Siemens & Halske A.G.
 Stearns Magnetic Products
 Sterling Electric Motors, Inc.
 Syntrol Co.
THOR POWER TOOL CO.
TRI-CLAD—SEE GENERAL ELECTRIC CO., INTERNATIONAL
 Unilever—see U.S. Electrical Motors, Inc.
 U.S. Electrical Motors, Inc.
 Varidrive—see U. S. Electrical Motors, Inc.
 Wagner Electric Corp.
 Waukesha Motor Co.
 Wesco—see Wesche Electric Co.
 Wesche Electric Co.
 Westinghouse Air Brake Co., Le Roi Div.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
 Westinghouse Electric Corp.
 White Motor Co.
 Worthington Corp.

PACKAGE SUBSTATION

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
GENERAL ELECTRIC CO., LTD.
GRAYBAR ELECTRIC CO., INC.
 Hitachi, Ltd.
 I-T-E Circuit Breaker Co.
 Kuhlman Electric Co.
 Leonard Electric Co.
 National Supply Co. (Pa.)
 Schoonmaker Co., Inc., P. G.
 Standard Transformer Co., The
 Westinghouse Electric Corp.

TRANSFORMERS AND RECTIFIERS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ASEA ELECTRIC, INC.
ASEA, SWEDEN
 Carpcor Mfg., Inc.
 John Davis & Son, Ltd.
 Esser Wire Corp., Parantite Wire & Cable Div.
 Euclid Electric & Mfg. Co., The
 General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
GENERAL ELECTRIC CO., LTD.
GRAYBAR ELECTRIC CO., INC.

Hevi-Duty Electrical Co.
 Hillman Co. Inc., C. Kirk
 Hitachi, Ltd.
 I-T-E Circuit Breaker Co.
 Johnson & Phillips, Ltd.
 Kuhlman Electric Co.
 W&H Nelson Ltd.
 Bruce Peebles & Co., Ltd.
 Reliance Electric & Engineering Co.
 Research-Cuttrell, Inc.
 Schoonmaker Co., Inc., P. G.
 Standard Transformer Co.
 Syntrol Co.
 Voltage Regulators
 Wagner Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
 Westinghouse Electric Corp.
 Weston Electrical Instrument Corp.

SWITCHES & STARTERS

ALLIS-CHALMERS MFG. CO.
ASEA, SWEDEN
 EC & M, Div. of Square D Co.
 Gen. Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., LTD.
GRAYBAR ELECTRIC CO., INC.
 Hitachi, Ltd.
 I-T-E Circuit Breaker Co.
 Micro Switch Div. of Minneapolis Honeywell
 Ohio Brass Co.
 Wadsworth Elec., The
 Westinghouse Electric Corp.

VOLTAGE REGULATORS

ALLIS-CHALMERS MFG. CO.
ALLIS CO., THE LOUIS
ASEA, SWEDEN
 Ateliers de Constructions Electriques de Charleroi
 Gen. Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., LTD.
GRAYBAR ELECTRIC CO., INC.
 Hitachi, Ltd.
 I-T-E Circuit Breaker Co.
 Westinghouse Electric Corp.

ENGINE EXHAUST**CONDITIONERS**

EIMCO CORP.
GETMAN BROS. MFG. DIV., INC.
HACK ENG. CO.
 Hirsch Bros. Machine Co., Inc.
 Hunslet Engine Co. Ltd., The
NATIONAL MINE SERVICE CO.
 North British Locomotive Co.
 OCM Catalytic Exhaust, OCM Diesel Exhaust, Oxy-Muffler Exhaust—see Oxy-Catalyst, Inc.
 Oxy-Catalyst, Inc.
 Ruth Co., The
 Universal Dredge Mfg. Co.

ENGINEERING SERVICES

See Plant Design and Construction; Exploration Services; Consulting Mining Engineers; Consulting Metallurgical Engineers

ENGINEERING SUPPLIES**& DRAFTING EQUIPMENT**

See also Surveying Instruments
 Bausch & Lomb Optical Co.
 Berger & Sons, Inc.
 Dietzgen Co., Eugene
 General Aniline & Film Corp., Osalid A Div.
 Geo-Optics Co., Inc.
HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ AG
 Keuffel & Esser Co.
 Luffkin Rule Co.
 Post Co., Frederick
 Rocky Mountain Instrument Co.
 White Instrument Co., David
WILD HEERBRUGG INSTRUMENTS, INC.
 Zeiss, Carl

ENGINES

See also Electrical Equipment
DIESEL AND SEMI-DIESEL
 A. E. C. Limited
 Alco Products, Inc.
ALLIS-CHALMERS MFG. CO., CONST. MACH. DIV.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ALLIS-CHALMERS MFG. CO., ENGINE—MATERIAL HANDLING EQUIP., THE
 American Locomotive Co.

American M.A.N. Corp.
 Baldwin-Lima-Hamilton Corp., Ed-dystone Div.
 Caterpillar Tractor Co.
CHICAGO PNEUMATIC TOOL CO.
 Continental Motors Corp.
 Cooper-Bessemer Corp., The
 Cummins Engine Co., Inc.
CURTIS-WRIGHT CORP.
DIESEL ENERGY CORP., KLOCKNER-HUMBOLDT-DEUTZ AG
 Enterprise Engine & Machinery Co.
 Fairbanks, Morse & Co.
 General Motors Corp., Detroit Diesel Engine Division
GENERAL MOTORS CORP.—ELECTRO-MOTIVE DIV.
GENERAL MOTORS OVERSEAS OPERATIONS
 Hall-Scott Motors, Inc.
HARNISCHFEGGER CORP.
 Hercules Motors Corp.
 I.H.C. Holland
INGERSOLL-RAND CO.
INTERNATIONAL HARVESTER CO.
INTERNATIONAL HARVESTER EXPORT CO.
 Kaelble G.m.b.H., Carl
KLOCKNER-HUMBOLDT-DEUTZ, A. G.
 Lister-Blackstone, Inc.
 Mannesmann Export G.m.b.H.
 Minneapolis-Moline Co.
MIRRELES, BICKERTON & DAY, LTD.
NORDBERG MFG. CO.
 Onan & Sons, Inc., D.W.
P & H—SEE HARNISCHFEGGER CORP.
 Davey Paxman & Co. Ltd.
 Perkins Engines Ltd.
 Roe-Blackburn Intl. Corp.
ROLLS-ROYCE LTD.
 Ruston & Hornsby Ltd.
 Schoonmaker Co., Inc., P. G.
 Sheppard Co., R. H.
 Waukesha Motor Co.
 White Motor Co., The
 Witte Eng. Wks., Oil Well Supply Div.
 U. S. Steel Co.
 Worthington Corp.

GASOLINE

ALLIS-CHALMERS MFG. CO., CONST. MACH. DIV.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ALLIS-CHALMERS MFG. CO., ENGINE—MATERIALS HANDLING EQUIP.
 Briggs & Stratton Corp.
 Continental Motors Corp.
 Fairbanks, Morse & Co.
 G. M. C., Allison Div.
GENERAL MOTORS OVERSEAS OPERATIONS
 Hall-Scott Motors, Inc.
 Hercules Motors Corp.
HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ AG
INTERNATIONAL HARVESTER CO.
INTERNATIONAL HARVESTER EXPORT CO.
 Kohler Co.
 Le Roi Div., Westinghouse Air Brake Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
 Minneapolis-Moline Co.
 National Supply Co., The, Engine Div.
 Onan & Sons, Inc., D. W.
 Ruston & Hornsby Ltd.
 Turbo Jet—see G. M. C., Allison Div.
 Turbo Prop—see G. M. C. Allison Div.
 Waukesha Motor Co.
 Westinghouse Air Brake Co., Le Roi Div.
 Westinghouse Air Brake Co. (Pa.)
 White Motor Company, Diesel Engine Div.
 Willys Motors, Inc.
 Wisconsin Motor Corp.
 Witte Engine Works, Oil Well Supply Div., U. S. Steel Corp.

TURBINE

ALLIS-CHALMERS MFG. CO.
 General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., LTD.
 Greenwood & Batley Ltd.
 Gutehoffnungshutte, A.G.
 Hitachi, Ltd.
 I.H.C. Holland
 Ruston & Hornsby, Ltd.
 Solar Aircraft Co.
 Waukesha Motor Co.
 Westinghouse Electric Corp.

EXCAVATORS

See also Tractors and Attachments; Dredges and Dredge Buckets; Loaders; Monitors; Scrapers

BACKHOES

ALLIS-CHALMERS MFG. CO., CONSTRUCTION EQUIPMENT DIVISION
 American—see Amer. Hoist & Derrick Co.
AMERICAN BRAKE SHOE CO.
 American Hoist & Derrick Co.
BALDWIN-LIMA-HAMILTON CORP.
 Bantam—see Schield Bantam Co.
 Bay City Shovels, Inc.
 Brown Corp. (Sales) Ltd., David
 Bucyrus-Erie Co.
CLARK EQUIP. CO., CONSTRUCTION MACH. DIV.
 Electric Steel Foundry Co.
 Fastback—see Electric Steel Foundry Co.
 Gar Wood Industries, Inc.
HARNISCHFEGGER CORP.
 Hough Co., Frank G.
 Hystaway—see Hyster Co.
 Hyster Co.
 Joost Mfg. Co.
 Koehring Co.
FRIED KRUPP
LIMA—SEE BALDWIN-LIMA-HAMILTON CORP.
 Link Belt Speeder Corp.
 Lorain—see Thew Shovel Co.
MACHINERY CENTER INC.
 Manitowoc Eng. Co.
MARION POWER SHOVEL CO.
 Northwest Eng. Co.
 Pence & Co., Inc., Earl H.
 Pettibone Mulliken Corp.
 Priestman Bros. Ltd.
 Quick-Way Truck Shovel Co.
 Ruston-Bucyrus Ltd.
 Schield Bantam Co.
 Schramm, Inc.
 Smith & Sons (Rodley) Thos.
 Thew Shovel Co.
 Tractohoe—see Tractomotive Corp.
 Tractomotive Corp.
 Unit Crane & Shovel Corp.
 Westinghouse Air Brake Co., Le Roi Div.
 “Bucket Wheel Excavators”
 Willys Motors, Inc.

BUCKET CHAINS

Gar Wood Industries, Inc.
 Orenstein-Koppel and Lubecker Maschinenbau A.G.
WESERHUTTE OTTO WOLFF G.M.B.H.

BUCKET WHEEL

Bucyrus-Erie Co.
 Gar Wood Industries, Inc.
 HEWITT-ROBINS, INC.
 Orenstein-Koppel and Lubecker Maschinenbau A. G.

CABLEWAYS

Stallkline
BRITISH ROPEWAY ENGINEERING CO., LTD.
CLARK EQUIP. CO., CONSTRUCTION MACH. DIV.
FRASER & CHALMERS ENG. WKS.
 Mitchell Ropeways Ltd.
 Ropeways Ltd.
SAUERMAN BROS., INC.
 Washington Iron Works

Tauilne

CLARK EQUIP. CO., CONSTRUCTION MACH. DIV.
FRASER & CHALMERS ENG. WKS.
 Mitchell Ropeways Ltd.
 Ropeways Ltd.
SAUERMAN BROS., INC.
 Washington Iron Works

DAGLINES

Diesel
 American—see Amer. Hoist & Derrick Co.
 American Hoist & Derrick Co.
BALDWIN-LIMA-HAMILTON CORP.
 Bantam—see Schield Bantam Co.
 Bay City Shovels, Inc.
 Bucyrus-Erie Co.
CLARK EQUIP. CO., CONST. MACH. DIV.
 Demag Aktiengesellschaft
 Fa. Ten Pas & Co.
FRASER & CHALMERS ENG. WKS.
 Gar Wood Industries, Inc.

Exploration Equipment

HARNISCHFEGGER CORP.
Koehring Co.
LIMA—SEE BALDWIN-LIMA-HAMILTON CORP.
Link Belt Speeder Corp.
Lorain—see Thew Shovel Co.
Manitowoc Eng. Co.
MARION POWER SHOVEL CO.
Northwest Eng. Co.
Page Eng. Co.
Priestman Bros. Ltd.
Quick Way Truck Shovel Co.
Ruston-Bucyrus Ltd.
Schild Bantam Co.
Thew Shovel Co.
Unit Crane & Shovel Corp.
Washington Iron Works
WESERHUTTE OTTO WOLFF G.M.B.H.

Electric

American Hoist & Derrick Co., Crosby-Laughlin Div.
Bantam—see Schild Bantam Co.
Bay City Shovels, Inc.
Bucyrus-Erie Co.
Demag Aktiengesellschaft
FRASER & CHALMERS ENG. WKS.
HARNISCHFEGGER CORP.
Koehring Co.
Link Belt Speeder Corp.
Manitowoc Eng. Co.
MARION POWER SHOVEL CO.
Northwest Eng. Co.
Page Eng. Co.
ROLLS-ROYCE LTD.
Ruston-Bucyrus Ltd.
Schild Bantam Co.
Thew Shovel Co.
Unit Crane & Shovel Corp.
WESERHUTTE OTTO WOLFF G.M.B.H.

SCRAPERS, SELF-PROPELLED

ALLIS-CHALMERS MANUFACTURING CO., CONST. MACH. DIV.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
BALDWIN - LIMA - HAMILTON CORP.
Beaumont—see Internl Combustion (Export) Ltd.
CW—SEE CURTISS-WRIGHT CORP., SOUTH BEND DIV.
Caterpillar Tractor Co.
CARRIALL—SEE LETOURNEAU-WESTINGHOUSE CO.
CLARK EQUIPMENT CO., CONST. MACH. DIV.
CURTISS-WRIGHT CORP., SOUTH BEND DIV.
GENERAL MOTORS CORP., EUCLID DIVISION
GENERAL MOTORS OVERSEAS OPERATIONS
Gismo—see Sanford Day Iron Works, Inc.
Gottwald, Leo
International Combustion (Export) Ltd.
INTERNATIONAL HARVESTER CO.
Landa Steel Co.
LETOURNEAU-WESTINGHOUSE CO.
Link Belt Speeder Corp.
Michigan—see Clark Equipment Co.
M-R-S Manufacturing Co.
Rogers Iron Works Co.
Sanford Day Iron Wks.
TOURNAFILL—SEE LE TOURNEAU-WESTINGHOUSE CO.
Westinghouse Air Brake Co. (Pa.)

SHAFT MUCKERS—see Shaft

Sinking

SHOVELS, POWER

Diesel

American Hoist & Derrick Co., **BALDWIN-LIMA-HAMILTON CORP.**
Bantam—see Schild Bantam Co.
Bay City Shovels, Inc.
Bucyrus-Erie Co.
Caterpillar Tractor Co.
CLARK EQUIPMENT CO., CONST. MACH. DIV.
Clyde Iron Works, Inc.
Demag Aktiengesellschaft
EIMCO CORP., THE
Electric Steel Foundry Co.
Gar Wood Industries, Inc.
HARNISCHFEGGER CORP.
Hitachi, Ltd.
Hunslet Engine Co. Ltd.
Koehring Co.

LIMA—SEE BALDWIN-LIMA-HAMILTON CORP.
Link-Belt Speeder Corp.
Manitowoc Engineering Corp.
MARION POWER SHOVEL CO.
MICHIGAN—SEE CLARK EQUIPMENT CO.
Newton Chambers & Co., Ltd.
Northwest Engineering Co.
P & H—SEE HARNISCHFEGGER CORP.
Priestman Bros. Ltd.
Quick-Way Truck Shovel Co.
Ruston-Bucyrus Ltd.
Schild Bantam Co.
Smith & Sons (Rodley) Ltd., Thos.
Thew Shovel Co.
Traxcavator—see Caterpillar Tractor Co.
Unit Crane & Shovel Corp.
WESERHUTTE OTTO WOLFF G.M.B.H.

Electric

American Hoist & Derrick Co., Crosby-Laughlin Div.
Bay City Shovels, Inc.
Bucyrus-Erie Co.
Demag Aktiengesellschaft
EIMCO CORP., THE
Electric Steel Foundry Co.
Goodman Mfg. Co.
HARNISCHFEGGER CORP.
Hitachi, Ltd.
Koehring Co.
Link-Belt Speeder Corp.
Lorain—see Thew Shovel Co.
Manitowoc Engineering Corp.
MARION POWER SHOVEL CO.
Northwest Engineering Co.
P & H—SEE HARNISCHFEGGER CORP.
Priestman Bros. Ltd.
Ruston-Bucyrus Ltd.
SALZGITTER MASCHINEN AKTIENGESellschaft
Schild Bantam Co.
Smith, Thos., & Sons (Rodley) Ltd.
Thew Shovel Co.
Unit Crane & Shovel Corp.
WESERHUTTE OTTO WOLFF G.M.B.H.

PARTS AND ATTACHMENTS

A & A Mfg. Co., Inc.
ALLOY STEEL & METALS CO.
AMER. MANGANESE STEEL DIV., AMERICAN BRAKE SHOE CO.
American Hoist & Derrick Co., **AMSCO—SEE AMERICAN BRAKE SHOE CO.**
BALDWIN-LIMA-HAMILTON CORP.
Bucyrus-Erie Co.
Caterpillar Tractor Co.
CLARK EQUIP. CO., CONSTRUCTION MACH. DIV.
COLORADO FUEL & IRON CORP.
COLUMBIA STEEL CASTING CO.
CURTISS-WRIGHT CORP., SOUTH BEND DIV.
Dolmar Maschinen Fabrik
EIMCO CORP., THE
Electric Steel Foundry Co.
Gar Wood Industries, Inc.
GENERAL MOTORS CORP., EUCLID DIV.
Hadfields Ltd.
Hall & Nielsen Ltd.
HARNISCHFEGGER CORP.
Koehring Co.
Link-Belt Speeder Corp.
Manitowoc Engineering Corp.
MARION POWER SHOVEL CO.
M-R-S Manufacturing Co.
Martin, Black & Co., Ltd.
Owen Bucket Co.
PACIFIC—SEE ALLOY STEEL & METALS CO.
Page Engineering Co.
Pettibone Mulliken Corp.
Quick-Way Truck Shovel Co.
Ruston-Bucyrus Ltd.
Smith & Sons, Thomas (Rodley) Ltd.
Schild Bantam Co.
Smith & Sons (Rodley) Ltd., Thos.
Taylor Wharton Iron & Steel Co.
Thew Shovel Co.
August Thiele G.m.b.H.
Unit Crane & Shovel Corp.
Vulcan Foundry Co.
WESERHUTTE OTTO WOLFF G.M.B.H.
Westinghouse Air Brake Co., Ind. Products Div.
Westinghouse Air Brake Co., La Roi Div.

EXPLORATION EQUIPMENT

See also Drills, Rock

Geochemical Equipment

Analytical Measurements, Inc.
Eberline Instrument Corp.
International Geophysics, Inc.
Menlo Research Lab.
Mobile Drilling, Inc.
Research Inc.

Geophysical Equipment

Abem Company
Analytical Measurements, Inc.
Askania-Werke A.G.
Bemis Bros. Bag Co.
Craelius Company Ltd.
Detection Div., Computer-Measurements Co.
Eberline Inst. Div.—Reynolds Elect. & Eng. Co.
Electro-Technical Labs.
Engineers Syndicate, Ltd.
Failing Co., George E.
Geodynamics, Inc.
Geo-Optic Co., Inc.
Geophysical Specialties Co.
Hycan Aerial Surveys, Inc.
International Geophysics, Inc.
JOY MFG. CO.
LONGYEAR CO., E. J.
Menlo Research Lab.
Mobile Drilling, Inc.
Rawson Electrical Instrument Co.
Salem Tool Co.
Schramm, Inc.
Texas Instruments, Inc., Industrial Instrumentation Div. (Houston)
Ultra-Violet Products, Inc.
United Geophysical Corp.
Univ. Transistor Prod. Corp.
VARIAN ASSOCIATES
Westinghouse Electric Corp.
Whites' Electronics
Winter-Weiss Co., The

EXPLORATION SERVICES

Aircraft

Aero Service Corp.
African Surveys (Proprietary Ltd.)
Auir, Ltd.
Bell Helicopter Co.
Engineers Syndicate, Ltd.
Fairchild Aerial Surveys, Inc.
International Geophysics, Inc.
Rick Helicopters
Sloan & Associates, Inc.
Tate Mine Development & Supply Co.
Urineo-Grand Junction Uranium Instruments Co.
Western Exploration Co.
World Wide Aerial Surveys (Aust.) Pty. Ltd.

DRILLING

Churn

Craelius Co. Ltd.
DIAMOND DRILL CONTRACTING CO.
Heinrichs Geos exploration Co.
International Geophysics, Inc.
JOY MFG. CO.
Koebel Diamond Tool Co.
Livingston & Wilson Exploration & Drilling Co.
LONGYEAR CO., E. J.
Minerals Engineering Co.
McDonald, T. J.
Moab Drilling Co.
Pennsylvania Drilling Co.
SALZGITTER MASCHINEN AKTIENGESellschaft
Shamrock Well Drilling Enterprises, Inc.
SPRAGUE & CO.
SPRAGUE & HENWOOD, INC.
Western Exploration Co.
World Mining Consultants, Inc.
Yuba Manufacturing Co.

Diamond

BOYLES BROS. DRILLING CO.
Boyles Bros. Drilling Co. Ltd. (Canada)
Craelius Co. Ltd.
DIAMOND DRILL CONTRACTING CO.
Du Jac Mfg. Corp.
Havlick, J. L.
Hitchcock Mfg. Co., Leo
International Geophysics, Inc.
JOY MANUFACTURING CO.

Junction Bit & Tool Co.
Koebel Diamond Tool Co.
Livingston & Wilson Exploration & Drilling Co.
LONGYEAR CO., E. J.
MCLINTOCK CO., R. S.
McDonald, T. J. (Colo.)
McDonald, T. J. (Mich.)
Moab Drilling Co.
Mobile Drilling, Inc.
Pennsylvania Drilling Co.
Powermite Drill & Tool Co.
Shamrock Drilling Enterprises
SMIT & CO., INC., ANTON
SPRAGUE & HENWOOD, INC.
St. Clair, John Q.
Thom Ltd., John
United Geophysical Corp.
Western Exploration Co.
Wheel Tracing Tool Co.
World Mining Consultants, Inc.

Rotary

Boyles Bros. Drilling Co., Ltd. (Canada)
Cardox Corp.
Carpes Mfg., Inc.
Demag Aktiengesellschaft
Geodynamics, Inc.
International Geophysics, Inc.
JOY MANUFACTURING CO.
LONGYEAR CO., E. J.
Mobile Drilling, Inc.
Pennsylvania Drilling Co.
Reich Bros. Mfg. Co.
St. Clair, John Q.
SALZGITTER MASCHINEN AKTIENGESellschaft
Tate Mine Development & Supply Co.
United Geophysical Corp.
Western Exploration Co.
World Mining Consultants, Inc.

SURVEYING

Aerial

Abem Company
Abrams Aerial Survey Corp.
Aero Service Corp.
African Surveys (Proprietary Ltd.)
Airborne Geophysics Ltd.
Canadian Aero Service Ltd.
CHAPMAN, WOOD AND GRISWOLD
Craelius Co. Ltd.
Elliott, D. H.
Fairchild Aerial Surveys, Inc.
Geodynamics, Inc.
Geo-Optic Co., Inc.
Heinrichs Geos exploration Co.
Hunting Technical Services, Inc.
Hycan Aerial Surveys, Inc.
International Geophysics, Inc.
KELLOGG EXPLORATION CO.
LONGYEAR CO., E. J.
Lundberg Explorations, Ltd.
Menlo Research Lab.
Permo Exploration Co.
Precision Radiation Instruments, Inc.
Radiac Company, Inc., The
Research, Inc.
Rick Helicopters, Inc.
Sloan & Associates, Inc.
St. Clair, John Q.
STILL & STILL
Tracerlabs, Inc.
Western Exploration Co.
World Wide Aerial Surveys (Aust.) Pty. Ltd.

Geochemical

Athins Technical Inc.
Geodynamics, Inc.
Hunting Airborne Geophysics Ltd.
Hunting Technical Services, Inc.
Heinrichs Geos exploration Co.
International Geophysics, Inc.
KELLOGG EXPLORATION CO.
LONGYEAR CO., E. J.
Menlo Research Lab.
Nucleonic Corp. of America
Ore Research & Laboratories
Radiac Company, Inc., The
Research, Inc.
STILL & STILL
Texas Instruments
Western Exploration Co.
WISSER & COX

Geological

Abem Company
Abrams Aerial Survey Corp.
Aero Service Corp.
African Surveys (Proprietary Ltd.)
BOYLES BROS. DRILLING CO.
Canadian Aero Service Ltd.
CHAPMAN WOOD, AND GRISWOLD

Craielius Co. Ltd.
Engineers Syndicate Ltd.
Fairchild Aerial Surveys, Inc.
Flaher Research Laboratory
Frederick, Francis H.
Geodynamics, Inc.
Geo-Engineering
Geo-Optic Co., Inc.
Heinrichs Geoeexploration Co.
Hunting Airborne Geophysics Ltd.
Hunting Technical Services, Inc.
Hull, Carlton D.
Hyon Aerial Surveys, Inc.
International Geophysics, Inc.
KELLOGG EXPLORATION CO.
LeGrande Sutcliffe & Gell Ltd.
LONGYEAR CO., E. J.
St. Clair, John Q.
STILL & STILL
Thomas, Conrad Ward
Van Horn, Earl C.
Western Exploration Co.
Wilson Exploration Co.
WISSER & COX
World Mining Consultants, Inc.
World Wide Aerial Surveys (Aust.) Pty. Ltd.

Geophysical

Abem Company
Aero Service Corp.
African Surveys (Proprietary Ltd.)
Atkins Technical Inc.
Canadian Aero Service, Ltd.
Craielius Co. Ltd.
Engineers Syndicate, Ltd.
Fairchild Aerial Surveys, Inc.
Frederick, Francis H.
Geodynamics, Inc.
Geo-Optic Co., Inc.
Geophysical Services, Inc.
Heinrichs Geoeexploration Co.
Hunting Airborne Geophysics Ltd.
Hunting Geophysical Services, Inc.
Hyon Aerial Surveys, Inc.
International Geophysics, Inc.
KELLOGG EXPLORATION CO.
Le Grand Sutcliffe & Gell Ltd.
LONGYEAR CO., E. J.
Lundberg Explorations, Ltd.
M-Scope—see Flaher Research Laboratory, Inc.
Menlo Research Lab.
Mining & Geophysical Services, Ltd.
Moab Drilling Co.
Mobile Drilling, Inc.
Nucleonic Corp. of America
Peale, Rogers
Precision Radiation Instruments, Inc.
Radiac Co., Inc., The
Research, Inc.
Shamrock Drilling Enterprises
Sloan & Associates, Inc.
STILL & STILL
Texas Instruments Inc.
Thomas, Conrad Ward
Turner & Associates
Tracerlab, Inc.
United Geophysical Corp.
Western Exploration Co.
Wilson Exploration Co.
World Mining Consultants, Inc.
World Wide Aerial Surveys (Aust.) Pty. Ltd.

EXPLOSIVES

See Blasting Supplies

FANS

See Ventilation Equipment and Supplies

FASTENERS, BELT

ABCs Scale Division, McDowell Co., Inc.
Alligator—see Flexible Steel Lacing Co.
American Rubber Mfg. Co.
Armstrong-Bray & Co.
Bonded Scale & Machine Co.
Carlyle Rubber Co., Inc.
Clipper Belt Lacer
Continental Gln Co.
Crescent Belt Fastener Co., Inc.
Flexco—see Flexible Steel Lacing Co.
Flexible Steel Lacing Co.
GENERAL ELECTRIC CO. LTD., THE
GOODALL RUBBER CO.
GOODRICH, B. F., INDUSTRIAL PRODUCTS CO.
INTERNATIONAL B. F. GOOD-RICH CORP.
NATIONAL MINE SERVICE CO.
Plategrip—see Armstrong-Bray & Co.

Rhoads, J. E., & Sons
Steeligrip—see Armstrong-Bray & Co.
Talcott, Inc., W. O. & M. W.

FEEDERS, ORE

Apron

AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—see AMERICAN BRAKE SHOE CO.
Aveling-Barford
Barber-Greene Co., Inc.
Baxter Ltd., W. H.
Bonded Scale & Mach. Co.
Chain Belt Co.
Christian Engineers, J. D.
Conveyor & Equip. Co.
Connellville Mfg. & Mine Supply Co.

Conveyor Co., The
Davison & Co. (Hexham) Ltd.
Demag Aktiengesellschaft
DENVER EQUIPMENT CO.
Diamond Iron Works, Div. Goodman Mfg. Co.
Eickhoff, Gebr. Maschinenfabrik u. Eisengieserei G.m.b.H.
Electric Steel Foundry Co.
FRASER & CHALMERS
GENERAL ELECTRIC CO., LTD., THE

Grundler Crusher & Pulverizer Co.
HACK ENGINEERING CO.
Haddfields Ltd.
HARDINGE CO., INC.
HAZEMAG
HEAD WRIGHTSON STOCKTON FORGE
HEWITT-ROBINS, INC.
Hirsch Bros. Machinery Co.
Iowa Mfg. Co.
Jeffrey Manufacturing Co.
Kenco
Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT-DEUTZ, A. G.
Link-Belt Co.
Lippmann Engineering Works
McDowell Co., Inc.
McLANAHAN & STONE CO.
McNally Pittsburgh Co.
MINE & SMELTER SUPPLY CO.
Miners Foundry & Mfg. Co.
Morse Bros. Machinery Co.
NATIONAL IRON CO.
NORDBERG MFG. CO.

Pegson Ltd.
Petibone Mulliken Corp.
Pioneer Engineering Div., Poor & Co., Inc.
Rex—see Chain Belt Co.
Richardson Scale Co.
Rogers Iron Works Co.
Ross Screen & Feeder Co.
Sheep Bridge Equip. Ltd.
Smith Engineering Works
SOUTHWESTERN ENG. CO.
Stephens-Adamson Mfg. Co.
Straub Manufacturing Co., Inc.
RICHARD SUTCLIFFE, LTD.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.

August Thiele G.m.b.H.
Tisco—see Taylor-Wharton Iron & Steel Co.
TRAYLOR ENG. & MFG. CO.
Universal—see Pettibone Mulliken Corp.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.
WEDAG
Wilmot Engineering Co.

Belt

ABCs Scale Division, McDowell Co., Inc.
American Rubber Mfg. Co.
Aveling-Barford
B. I. F. Industries, Inc.
Barber Greene Co.
Bear—see American Rubber Mfg. Co.
Bonded Scale and Machine Co.
Chain Belt Co.
Christian Engineers, J. D.
Coeur d'Alene Hardware & Foundry Co.
Continental Conveyor & Equip. Co.

Conveyor Co., The
Crackerjack—see American Rubber Mfg. Co.

Demag Aktiengesellschaft
DENVER EQUIPMENT CO.
Flexible Steel Lacing Co.
FRASER & CHALMERS
Galigher Co.
Grundler Crusher & Pulverizer Co.
HACK ENG. CO.
HARDINGE CO., INC.
HAZEMAG
HEAD WRIGHTSON STOCKTON FORGE

HEWITT-ROBINS, INC.
Hirsch Bros. Machinery Co.
INTERNATIONAL B. F. GOOD-RICH

Iowa Mfg. Co.
Jeffrey Manufacturing Co.
Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT-DEUTZ, A. G.

Link-Belt Co.
Lippmann Engineering Works
Magnetic Eng. & Mfg. Co.
McDowell Co., Inc.
McLANAHAN & STONE CORP.

MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Miners Foundry & Mfg. Co.
Morse Bros. Machinery Co.
The National Filter Media Corp.
NATIONAL IRON CO.

Pegson Ltd.
Petibone Mulliken Corp.

Pioneer Engineering, Div. Poor & Co., Inc.

Rex—see Chain Belt Co.
Richardson Scale Co.
Sheepbridge Equip. Ltd.

Smith Engineering Works
Stephens-Adamson Mfg. Co.
Stokes & Co. Ltd., R. O.

Stubbe, Albert
RICHARD SUTCLIFFE LTD.

TELLURIDE IRON WORKS CO.
Thermoid Co.

August Thiele, G.m.b.H.
Universal Dredge Mfg. Co.

Universal Road Mach.
Washington Machinery Co.

WEDAG

Chain

AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.

AMSCO—see AMERICAN BRAKE SHOE CO.

Bonded Scale & Machine Co.
Chain Belt Co.

Christian Engineers, J. D.
Continental Conveyor & Equip. Co.

Demag Aktiengesellschaft
Electric Steel Foundry Co.

Grundler Crusher & Pulverizer Co.
HACK ENG. CO.

HARDINGE CO., INC.
HAZEMAG

Hirsch Bros. Machy. Co.
Jeffrey Manufacturing Co.

Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT-DEUTZ, A. G.

Link-Belt Co.
Lippmann Engineering Works

Marcar & Co. Ltd., Alexander
Morse Chain Co.

Rex—see Chain Belt Co.
Ross Screen & Feeder Co.

Smith Engineering Works
Stephens-Adamson Mfg. Co.

RICHARD SUTCLIFFE, LTD.
TELLURIDE IRON WORKS, CO.

Thiele, August G.m.b.H.
Universal Dredge Mfg. Co.

WEDAG

Constant Weight

ABCs Scale Division, McDowell Co., Inc.
Conveyor Co., The
HARDINGE CO., INC.
HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ AG
Jeffrey Manufacturing Co.
Kennedy-Van Saun Mfg. & Eng. Corp.
INDUSTRIAL PHYSICS & ELECTRONICS CO.
International Combustion, Ltd.
Link-Belt Co.
Merrick Scale Mfg. Co.

Richardson Scale Co.
Schaffner Poidometer Co.
Simplicity Engineering Co.
Syntron Co.
Washington Mach. Co.
Waytrol—see Jeffrey Manufacturing Co., The
WEDAG

RECIPROCATING

GOULD & CO., GORDON I.
Link-Belt Co.

DISC

DEISTER CONCENTRATOR CO.
Link-Belt Co.

Fan

AMERICAN BRAKE SHOE CO.
Bonded Scale and Machine Co.
Chain Belt Co.
Christian Engineers, J. D.
Cleveland Vibrator Co., The
Coeur d'Alene Hardware & Foundry Co.
Connellville Mfg. & Mine Supply Co.

Conveyor Co., The
Diamond Iron Works, Div. Goodman Mfg. Co.

Electric Steel Foundry Co.
Eries Mfg. Co.
FRASER & CHALMERS ENG. WKS.

Grundler Crusher & Pulverizer Co.
HACK ENGINEERING CO.

Haddfields Ltd.
HAZEMAG

HEWITT-ROBINS, INC.
Hirsch Bros. Machinery Co.

Iowa Mfg. Co.
Jeffrey Manufacturing Co.

Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT-DEUTZ, A. G.

Link-Belt Co.
Lippmann Engineering Works

McLANAHAN & STONE
McNally Pittsburgh Co.

Miners Foundry & Mfg. Co.
NATIONAL IRON CO.

Pioneer Engineering, Div. Poor & Co., Inc.

Rogers Iron Works
Scott's Concentrators

Sheepbridge Equip. Ltd.
Simplicity Engineering Co.

Smith Engineering Works
Stephens-Adamson Mfg. Co.

RICHARD SUTCLIFFE, LTD.
Taylor-Wharton Iron & Steel Co.

TELLURIDE IRON WORKS CO.
Tisco—see Taylor-Wharton Iron & Steel Co.

TRAYLOR ENG. AND MFG. CO.
Universal Dredge Mfg. Co.

Universal Engineering Corp.
Washington Machinery Co.

REVOLVING

CONCENCO—see DEISTER CONCENTRATOR CO.
DEISTER CONCENTRATOR CO.
Link-Belt Co.

Table

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP

Campo Mfg. Inc.
Chain Belt Co.

CONCENCO—see DEISTER CONCENTRATOR CO.

Connellville Mfg. & Mine Supply Co.

Continental Conveyor & Equip. Co.
DEISTER CONCENTRATOR CO.

FRASER & CHALMERS ENG. WKS.

GENERAL ELECTRIC CO. LTD., THE
HARDINGE CO., INC.

Jeffrey Mfg. Co.
KLOCKNER-HUMBOLDT-DEUTZ, A. G.

Link-Belt Co.
Fulva Corp.

Stephens-Adamson Mfg. Co.
TRAYLOR ENG. & MFG. CO.

REAGENT

ABCs Scale Div., The McDowell Co.
Coeur d'Alene Hardware & Foundry Co.

Davison & Co. (Hexham) Ltd.
DENVER EQUIPMENT CO.

Eries Manufacturing Co.
Fischer & Porter Co.

Galigher Co., The
Gear—see Galigher Co., The

Geary Junior—see Galigher Co., The
INDUSTRIAL PHYSICS & ELECTRONICS CO.
Infleco, Inc.

Manufacturers' Complete Names and Addresses are listed on the last pages of this yellow section. Advertisers in this issue are listed in boldface capital letters.

Filter Media

Jeffrey Manufacturing Co.
KLOCKNER-HUMBOLDT-DEUTZ, A. G.
MASSCO-ADAMS—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER CO.
Minerals et Metaux
Morse Bros. Machinery Co.
Syntron Co.
WEDAG, A. G.
WESTERN MACHY. CO.

VIBRATING

Bin-Dictator Co., The
Carrier Conveyor Corp.
Eries Mfg. Co.
Link-Belt Co.
Morgordskammars Mek. Verkstad
A. B.
Simplicity Eng. Co.
Syntron Co.

FILTER MEDIA

Aloxite—see Carborundum Co., The
American Air Filter Co. Inc.
BRITISH NYLON SPINNERS, LTD.
Burwell—see Minerals Eng. Co.
Celite—see Johns-Manville
Cleveland Wire Cloth & Mfg. Co., The
Carborundum Co., The
COAST MFG. & SUPPLY CO.
Dicalite Div., Great Lakes Carbon Corp.
DORR-OLIVER INC.
EIMCO CORP., THE
Feon—see Filtration Engineers Div.
Filtration Engineers, Div. American Machine & Metals, Inc.
Filter Fabrics, Inc.
Great Lakes Carbon Corp., Mining & Mineral Prod. Div.
Johns-Manville Sales Corp.
Ludlow-Saylor Wire Cloth Co.
National Filter Media Corp.
NFM—see National Filter Media Corp.
Norton Company
The Permutit Company
Pendleton Woolen Mills
PETERSON FILTERS & ENG. CO.

FILTERS

AIR

Allied Witan Co., Inc.
ATD Mufflers—see Allied Witan Co., Inc.
American Air Filter Co., Inc.
ATLAS COPCO, A. B., SWEDEN
Bemis Bro. Bag Co.
CEAG
Carriers Corp.
CHICAGO PNEUMATIC TOOL CO.
COAST MFG. & SUPPLY CO.
Condensfilter—see Hankison Corp.
Coppus Engineering Corp.
DriAir—see New Jersey Meter Co.
Ducon Co.
GARDNER DENVER CO.
GOODYEAR INTERNATIONAL CORP.
Gutehoffnungsschutte A.G.
Hankison Corp.
HAZEMAG OF GERMANY
Hitachi, Ltd.
HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ AG
International Combustion (Export) Ltd.
Johnson March Corp.
Kennedy-Van Saun Mfg. & Eng. Corp.
Lincoln Engineering Co.
Mine Safety Appliances Co.
New Jersey Meter Co.
Staplex Co., The
Sturtevant Eng. Co. Ltd.
THOR POWER TOOL CO.
Ultra-air—see Mine Safety Appliances Co.
Watts Regulator Company
WEDAG
WESTERN PRECIPITATION CORP.
Westinghouse Air Brake Co., Ind. Products Div.
Westinghouse Electric Corp., Sturtevant Div.
Wheelabrator Corp.
Winslow Engineering & Mfg. Co.

CONCENTRATE

AMERICAN—SEE DORR-OLIVER INC.
Bee-Tee—see Galigher Co., The
Bemis Bros. Bag Co.
Bird Machine Co.
Buck & Associates, Carl
BURT—SEE MINE & SMELTER SUPPLY CO.

Carpco Mfg. Inc.
DENVER EQUIPMENT CO.
DORR-OLIVER INC.
Dorr-Oliver G.m.b.H.
DORR—SEE DORR-OLIVER, INC.
EIMCO CORP., THE
Feon—see Filtration Engineers, Div.
Filtration Engineers, Div.—American Machine & Metals, Inc.
Galigher Co., The
HARDINGE CO., INC.
Hirsch Bros. Machy Co.
HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ AG
Inflico, Inc.
International Combustion Ltd.
KELLY—SEE DORR-OLIVER, INC.
MINE & SMELTER SUPPLY CO.
Morse Bros. Machinery Co.
OLIVER—SEE DORR-OLIVER, INC.
Davy Paxman Co. Ltd.
Permutit Company
PETERSON FILTERS & ENGINEERING CO.
SWEETLAND—SEE DORR-OLIVER, INC.
WEDAG

OH

DORR-OLIVER, INC.
Dorr-Oliver G.m.b.H.
Eries Manufacturing Co.
Filpro—see U. S. Hoffman Machy. Co.
GARDNER-DENVER CO.
HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ AG
Inflico, Inc.
Schoonmaker Co. Inc., P. G.
Tanning & B. Co., The
THOR POWER TOOL CO.
U. S. Hoffman Machinery Corp.
Winslow-Weld—see Winslow Eng. & Mfg. Co.
Winslow & Mfg. Engineering Co.

FIRE BRICKS

See Also Refractories
BARCOCK & WILCOX CO., THE
DENVER FIRE CLAY CO., THE
SPANG & CO.

FIRST AID SUPPLIES

See Safety Equipment

FLOTATION MACHINES

Agitair—see Galigher Co., The
Amag-Hilpert-Pegnitshutte A.G.
Birtley Engineering Ltd.
Booth Co., Inc.
Coeur d'Alene Hardware & Foundry Co.
Davison & Co. (Hexham) Ltd.
DORR-OLIVER INC.
DENVER EQUIPMENT CO.
FAGERGREN & STEFFENSEN—SEE WESTERN MACHINERY CO.
FRASER & CHALMERS
Galigher Co., The
Head Wrightson Colliery Engineering Ltd.
Inflico, Inc.
International Combustion Products, Ltd.
Jetalir—see Morse Bros., Machinery Co.
KLOCKNER-HUMBOLDT-DEUTZ, A. G.
Knapp & Bates, Ltd.
KRUPP, FRIED. MASCHINEN UND STAHLBAU RHEINHAUSEN
Magnetic Engineering & Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Minerals et Metaux
Morse Bros. Machinery Co.
National Tank & Pipe Co.
Powermite Drill & Tool Co.
SANTO FE TANK DIV., FLUOR PRODUCTS CO.
STEARNS-ROGER MFG. CO.
U. S. Hoffman Mach. Corp.
WEDAG (WESTFALIA DINNEDAHLE GROPPPEL AG)
WEMCO-FAGERGREN—SEE WESTERN MACH. CO.
WESTERN MACHINERY CO.
Westinghouse Electric Corp., Sturtevant Div.

FLOTATION REAGENTS

See Reagents and Chemicals

FRAMERS

See Saws, Power

FRICTION MATERIAL

AMERICAN BRAKE SHOE CO., EXPORT DIV.
INTERNATIONAL B. F. GOODRICH CORP.
Thermold Rubber Co.
TOOL STEEL GEAR & PINION CO.

FURNACES

See Pyrometallurgical Equipment

FUSE

See Blasting Equipment

GAS TURBINES

Solar Aircraft Co.

GATES

See Bins, Chutes and Accessories

GAUGES

Air Reduction Sales Co.
Aldon Co., R. R. Track
Beckman Instruments, Inc.
Bristol Co., The
Davison & Co. (Hexham) Ltd.
Daystrom-Weston Sales Div., Daystrom Inc.
Foxboro Co., The
GENERAL ELECTRIC CO., INTERNATIONAL
Industrial Nucleonics Corp.
Lufkin Rule Co.
Lunkenheimer Co., The
Minneapolis-Honeywell Regulator Co.
Norwood Controls Unit
Tracerlab, Inc.
Weston Electrical Instrument Corp.

GEAR MOTORS

See Motors

GEARS

See also Speed Changers; Open Gearing; Drives; Shaft-Mounted Drives
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
ASEA, SWEDEN
Bethlehem Steel
Brown Corp. (Sales) Ltd. David
BROWN, INC., DAVID
Brown Industries, Ltd. David
Christian Engineers, J. D.
Cleveland Worm & Gear Co., The
Coeur d'Alene Hardware & Foundry Co.
Columbia Steel Casting Co. Inc.
Dodge Aktiengesellschaft
Dodge Mfg. Corp.
Falk Corp., The
Farrel-Birmingham Co., Inc.
Gen. Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
HEWITT-ROBINS, INC.
Hirsch Bros. Machine Co., Inc.
HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ AG
Jeffrey Manufacturing Co.
Link-Belt Co.
Morse Chain Co.
Neco Industries Inc.
Philadelphia Gear Works, Inc.
BALZGITTER MASCHINEN AKTIENGESELLSCHAFT
Schoonmaker Co. Inc., P. G.
STEARNS-ROGER MFG. CO., THE
Stephens-Adamson Mfg. Co.

Taylor-Wharton Iron & Steel Co.
TOOL STEEL GEAR & PINION CO., THE
U. S. Electrical Motors, Inc.
Universal Gear Works, Inc.
Vulean Iron Works, (Pa.)
Walker Bros. (Wigan) Ltd.
WEDAG
Western Foundry Co.
Western Gear Corp. (Calif.)
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Worthington Corp.
Yuba Mining Co.

GEIGER & SCINTILLATION COUNTERS

See also Exploration Equipment
ACEC
Atomic Engineering Corp.
Braun-Knecht-Heimann Co.
Carpco Mfg. Inc.
COLORADO ASSAYING CO.
Detection Div., Computer-Measurements Co.
Eberline Inst. Div., Reynolds Elect. & Eng. Co.
Electro-Technical Labs.
Engineers Syndicate, Ltd.
GENERAL ELECTRIC CO., INTERNATIONAL
GENERAL ELECTRIC CO. LTD.
Hitachi, Ltd.
Hysan Aerial Survey, Inc.
Junction Bit & Tool Co.
Menlo Research Lab.
Nuclear Corp. of America
Nucleonic Corp. of America
Phillips Electronics Instruments, Inc.
Radiac Co., Inc., The
Snyders Mine & Chemical Lab.
Uranium Engr. Co.
Ultra Violet Prod., Inc.

GENERATORS

See Electrical Equipment

GEOPHYSICAL SURVEYS

See Exploration Services

GIANTS

See Monitors

GRADERS

ADAMS—SEE LE TOURNEAU-WESTINGHOUSE CO.
ALLIS-CHALMERS MANUFACTURING CO., CONST. MACHY. DIV.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Austin-Western—See Baldwin-Lima-Hamilton Corp.
Aveling-Barford
Caterpillar Tractor Co.
EL LOADER (SEE HARNISCH-FEGER CORP.)
Exolon Company, The
Haiss Mfg. Co., Inc.
Huber Warco Co.
LE TOURNEAU-WESTINGHOUSE CO.
Petibone Mulliken Corp.
Yuba Consolidated Industries, Inc.

GRINDERS

See Sharpeners, Rock Bit

GRINDING EQUIPMENT

See also Pulverizers
AUTOGENOUS
Baker Perkins Ltd.
HARDINGE CO., INC.
HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ AG

Knapp & Bates, Ltd.
MARCY, SEE MINE & SMELTER
SUPPLY CO.

BALL MILLS

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
BABCOCK & WILCOX CO.
Baker Perkins Ltd.
F. J. Brindley & Sons (Sheffield)
Ltd.
COATES STEEL PRODS CO.
Coeur d'Alene Hardware & Foundry
Co.
DENVER EQUIPMENT CO.
Dravo Corp.
EIMCO CORP., THE
Each-Werke, K. G.
Foster Wheeler Corp.
FRASER & CHALMERS ENG.
WKS.
Gallagher Co.
Gutehoffnungshutte A.G.
Knapp & Bates, Ltd.
KRUPP, FRIED. MASCHINEN
UND STAHLBAU RHEIN-
HAUSEN
Grundler Crusher & Pulverizer Co.
HARDINGE CO., INC.
HEAD WRIGHTSON STOCKTON
FORGE
Hirsch Bros. Machinery Co.
International Combustion, Ltd.
Kennedy-Van Saun Mfg. & Eng.
Corp.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
Knapp & Bates, Ltd.
LAKE SHORE, INC.

BALLS

ACF Industries, Inc., American Car
& Foundry Div.
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO.
BABCOCK & WILCOX CO., THE
Baker Perkins Ltd.
Bethlehem Steel
C F & I—SEE COLORADO FUEL
& IRON CORP., THE
Calumet & Hecla, Inc., Calumet
Div.
CARBEX—SEE COATES STEEL
PRODUCTS CO.
COATES STEEL PRODUCTS CO.
Coeur d'Alene Hardware & Foundry
Co.
COLORADO FUEL & IRON
CORP., THE
CONCAVEY—SEE ALLIS-CHAL-
MERS MFG. CO.
Fagersta Steels Pacific Inc.
Firth Sterling Ltd.
Foster Wheeler Corp.
General Motors Corp., New Depart-
ment Divan.
Granby Mining Co., Ltd., Allenby
Foundry Div.
Hadfields Ltd.
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON
FORGE, LTD.
International Combustion Ltd.
KENNAMETAL, INC.
Kennedy-Van Saun Mfg. & Eng.
Corp.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
Knapp & Bates, Ltd.
MINE & SMELTER SUPPLY CO.
NATIONAL MALLEABLE &
STEEL CASTINGS CO.
NI Hard—see Calumet & Hecla,
Inc., Calumet Div.
Sheepbridge Equip. Co. Ltd.
SHEFFIELD DIV., ARMCO STEEL
CORP.
S K F Industries Inc.
U. S. Steel Corp., Columbia-Geneva
Steel Div.
USS—See U. S. Steel Export Co.
Western Foundry Co.

LINERS

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO.,
EXPORT DIV.
BABCOCK & WILCOX CO., THE
Baker Perkins Ltd.
Bethlehem Steel
Calumet & Hecla, Inc., Calumet
Div.
Coeur d'Alene Hardware & Foundry
Co.
Columbia Steel Casting Co., Inc.
DENVER EQUIPMENT CO.
EIMCO CORP., THE
Electric Steel Foundry Co.
GENERAL ELECTRIC CO. LTD.
Granby Mining Co., Ltd., Allenby
Foundry Div.
Hadfields Ltd.
HARDINGE CO., INC.

HEAD WRIGHTSON, STOCKTON
FORGE LTD.
Hirsch Bros. Machine Co., Inc.
HUMBOLDT, KLOCKNER-HUM-
BOLDT-DEUTZ AG
International Combustion, Ltd.
Kennedy-Van Saun Mfg. & Eng.
Corp.
Knapp & Bates, Ltd.
MCANAHAN & STONE CORP.
MINE & SMELTER SUPPLY CO.
Miners Foundry & Mfg. Co.
NATIONAL MALLEABLE &
STEEL CASTING CO.
NI-Hard—see Calumet & Hecla, Inc.
Calumet Div.
Sanford-Day Iron Works Inc.
SMITH & CO., F. L.
Taylor-Wharton Iron & Steel Co.
TRAYLOR ENG. & MFG. CO.
USS—See U. S. Steel Corp.
UNITED STATES STEEL EXPORT
CO.
U. S. Steel Corp., Columbia-Geneva
Div.

PEBBLE MILLS

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
Baker Perkins Ltd.
DENVER EQUIPMENT CO.
Dravo Corp.
EIMCO CORP., THE
FRASER & CHALMERS ENGR.
WKS.
GENERAL ELECTRIC CO. LTD.,
THE
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON
FORGE, LTD.
International Combustion, Ltd.
Kennedy-Van Saun Mfg. & Eng.
Corp.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
Knapp & Bates, Ltd.
MARCY—SEE MINE & SMELTER
SUPPLY CO.
MINE & SMELTER SUPPLY CO.
NORDBERG MANUFACTURING
CO.
Pegson Ltd.
SMITH & CO., F. L.
STEARNS-ROGER MFG. CO.
Straub Manufacturing Co. Inc.
Thunus Mek. Verktsted, A. S.
TRAYLOR ENG. & MFG. CO.
U. S. Steel Corp.
WEDAG
Wilkinson Rubber Linatex, Ltd.

ROD MILLS

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
Bethlehem Steel
COLORADO FUEL & IRON
CORP.
DENVER EQUIPMENT CO.
Dravo Corp.
EIMCO CORP., THE
GENERAL ELECTRIC CO. LTD.,
THE
Gutehoffnungshutte A.G.
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON
FORGE, LTD.
Hirsch Bros. Machine Co., Inc.
International Combustion, Ltd.
Kennedy-Van Saun Mfg. & Eng.
Corp.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
Knapp & Bates, Ltd.
MARCY—SEE MINE & SMELTER
SUPPLY CO.
MINE & SMELTER SUPPLY CO.
Miners Foundry & Mfg. Co.
Morse Bros. Machinery Co.
NORDBERG MFG. CO.
Pegson Ltd.
Sheepbridge Equip. Ltd.
SMITH & CO., F. L.
STEARNS ROGER MFG. CO. (ROD
CHARGERS)
Straub Manufacturing Co. Inc.
Thunus Mek. Verktsted, A. S.
TRAYLOR ENG. & MFG. CO.
WEDAG

ROD MILL CHARGERS
GENERAL ELECTRIC CO. LTD.
WEDAG

RODS

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
Bethlehem Steel
C F & I—SEE COLORADO FUEL
& IRON CORP., THE
COLORADO FUEL & IRON
CORP.
Fagersta Steels Pacific Inc.
Hadfields Ltd.
HARDINGE CO., INC.
Humboldt, Klockner-Humboldt-Deuts-
AG
KENNAMETAL, INC.
Kennedy-Van Saun Mfg. & Eng.
Corp.
Knapp & Bates, Ltd.
MINE & SMELTER SUPPLY CO.
SHEFFIELD DIV., ARMCO STEEL
CORP.
U. S. Steel
U. S. Steel Corp., Columbia-Geneva
Div.
UNITED STATES STEEL EXPORT
CO.
WEDAG
Youngstown Sheet & Tube Co., The

TUBE MILLS
Dravo Corp.
EIMCO CORP., THE
FRASER & CHALMERS ENG.
WKS.
GENERAL ELECTRIC CO. LTD.,
THE
Gutehoffnungshutte A.G.
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON
FORGE, LTD.
International Combustion (Export)
Ltd.
Kennedy-Van Saun Mfg. & Eng.
Corp.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
Knapp & Bates, Ltd.
LAKE SHORE, INC.
MARCY—SEE MINE & SMELTER
SUPPLY CO., THE
MINE & SMELTER SUPPLY CO.
Miners Foundry & Mfg. Co.
NORDBERG MFG. CO.
Pegson Ltd.
Sheepbridge Equip. Ltd.
SMITH & CO., F. L.
Straub Manufacturing Co. Inc.
Sturtevant Eng. Co. Ltd.
Thunus Mek. Verktsted, A. S.
TRAYLOR ENG. & MFG. CO.
WEDAG

GRIZZLIES

See Screens, Grizzlies and
Accessories

GROUTING

See also Concreting Equipment
EQUIPMENT
Air Placement Equip. Co.
Air Placo—see Air Placement
Equip. Co.
Cement Gun Co.
CHICAGO PNEUMATIC TOOL CO.
CHRISTENSEN DIAMOND PROD-
UCTS CO.
Cementation Co. Ltd. The
Craelius Co. Ltd.
DIAMOND DRILL CONTRAC-
TING CO.
GARDNER-DENVER CO.
Grout-or Blast—see Air Placement
Equip. Co.
Gunite—see Air Placement Equip
Co.
INTERNATIONAL B. F. GOOD-
RICH
Koehring Co.
LONGYEAR CO., E. J.
Mayo Tunnel & Mine Equipment
Mobile Drilling Inc.
MCCLINOCK CO., E. S.
Morse Bros. Machinery Co.
Pendril—see Pennsylvania Drilling
Co.
Pennsylvania Drilling Co.
SPRAGUE & HENWOOD, INC.
THOR POWER TOOL CO.
Torkret G.m.b.H.
True Gun-All Equipment Corp.

SERVICES

BOYLES BROS. DRILLING CO.
Cementation Co. Ltd., The
Corwin & Co. Inc.
DIAMOND DRILL CONTR. CO.
Dravo Corp.
JOY MANUFACTURING COM-
PANY
LONGYEAR CO., E. J.
McKenzie & Whittle Contractors
Mobile Drilling Inc.
Earl C. Van Horn

HARD FACING

See Welding Equipment

HATS

See Safety Equipment

**HAULAGE UNITS,
OFF-RAIL**

See also Truck and Trailers;
Self Loading Transport; Shuttle
Cars

A. E. C. Ltd.
ALLIS-CHALMERS MFG. CO.,
CONSTRUCTION MACHY.
DIV.
Athey Products Corp.
Autocar—see T. White Motor Co.,
Autocar Trucks Div.
CW—SEE CURTISS-WRIGHT
CORP., SOUTH BEND DIV.
CURTISS-WRIGHT CORP., SOUTH
BEND DIV.
Dart Truck Co.
Differential Steel Car Co.
Easton Car & Construction Co.
EIMCO CORP., THE
Euclid Division, General Motors
Corp.
Ford Motor Co., Ford Division
Four Wheel Drive Auto Co., The
Fruehauf Trailer Co.
Gallon Allsteel Body Co.
GENERAL MOTORS CORP.,
EUCLID DIV.
GENERAL MOTORS OVERSEAS
OPERATIONS
GETMAN BROTHERS MFG. CO.
Giamo—see Sanford Day Iron
Works, Inc.
Goodman Mfg. Co.
Heil Co., The
Hunslet Engine Co.
Howe Scale Co.
INTERNATIONAL HARVESTER
CO.
Jeffrey Mfg. Co., The
JOY MANUFACTURING TRUCK
CO.
Joy-Sullivan Ltd.
Carl Kaelble
Koehring Co.
Landis Steel Co.
LE TOURNEAU-WESTINGHOUSE
CO.
MR-S Manufacturing Company
National Mine Service Co.
Napco Industries, Inc.
Ogden Iron Works Co.
Ortrac, Inc.
Sanford-Day Iron Works, Inc.
SCOOT-CRETE—SEE GETMAN
BROS. MFG. DIV., INC.
TOURNAUWOPPER—SEE LE
TOURNEAU-WESTING-
HOUSE CO.
TOURNAUWOPPER—SEE LE TOU-
NEAU-WESTINGHOUSE CO.
Unit Rig & Equipment Co.
Westinghouse Air Brake Co., Le
Roi Div.
White Motor Co., Autocar, Trucks
Div.

HEADFRAMES

STEEL

Allison Steel Mfg. Co.
Bethlehem Steel
BOYLES BROS. DRILLING CO.
BACKE ENG. CO.
HEAD WRIGHTSON, STOCKTON
FORGE, LTD.
HUMBOLDT, KLOCKNER-HUM-
BOLDT-DEUTZ AG
LAKE SHORE, INC.
Mayo Tunnel & Mine Equip.
NATL. IRON CO.
TELLURIDE IRON WKS.

HEATERS

AIR

Carrier Corp.

Manufacturers' Complete Names and Ad-
dresses are listed on the last pages of this
yellow section. Advertisers in this issue
are listed in boldface capital letters.

Hoist Communications

Dravo Corp.
Foster Wheeler Corp.
General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
GENERAL ELECTRIC CO. LTD.
GRAYBAR ELECTRIC CO., INC.
Grinnell Co., Inc.
International Combustion Ltd.
KLOCKNER-HUMBOLDT-DEUTZ, A. G.
Loesche, Germany
Watlow Elec. Mfg. Co.
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Westinghouse Electric Corp., Star-
tevant Div.

SPACE

American Blower Corp.
Carrier Corp.
Dravo Corp.
General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
GENERAL ELECTRIC CO. LTD.
GRAYBAR ELECTRIC CO., INC.
HUMBOLDT KLOCKNER-HUMBOLDT-DEUTZ AG
Iron Fireman Mfg. Co.
U. S. Rubber Co.
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

HOIST COMMUNICATIONS

See Communications

HOIST CONTROLS and SAFETY EQUIPMENT

ALLIS-CHALMERS MFG. CO.
ASEA, SWEDEN
Black's Mng. Equip., Ltd.
Bullard Co., E. D.
Euclid Electric & Mfg., The
FRASER & CHALMERS ENG. WKS.
Gen. Electric Co., Apparatus Sales Div.
Gutehoffnungshutte, A.G.
HEAD WRIGHTSON STOCKTON FORGE
LILLY—SEE LOGAN ENGR. CO.
LOGAN ENGR. CO.
Mine Safety Appliances Co.
Bruce Peebles & Co., Ltd.
Shepard Niles Crane & Hoist Corp.
SIMPLEX—SEE LOGAN ENGR. CO.
Vulcan Iron Works
Westinghouse Electric Corp.

HOISTING CABLE

See Rope, Wire

HOISTING EQUIPMENT

See also Chain Hoists; Rope, Wire

AUTOMATIC SKIP LOADING DEVICES

ALIMAK-VERKEN AB
ASEA, SWEDEN
Barker, Davies & Co.
Simon Carves Ltd.
Connellsville Mfg. & Mine Supply Co.
Demag Aktiengesellschaft
Gutehoffnungshutte, A.G.
Hirsch Bros. Machinery Co.
INDUSTRIAL PHYSICS & ELECTRONICS CO.
International Combustion Ltd.
Jeffrey Mfg. Co.
LAKE SHORE, INC.
Link-Belt Co.
Marcar & Co. Ltd., Alexander
McDowell Co., Inc.
Mitchell Ropeways Ltd.
NATIONAL IRON CO.
Rogers Iron Works Inc.
Shaft & Development Machines, Inc.
Sheepbridge Equip. Ltd.
Vulcan Iron Works Co.

FRICTION HOISTS

American—see American Hoist & Derrick Co.
American Hoist & Derrick Co.
ASEA ELECTRIC INC.

ASEA, SWEDEN
Barker, Davies & Co.
BLACK'S MINING EQUIPMENT, LTD.
Clyde Iron Works, Inc.
Connellsville Mfg. & Mine Supply Co.
Duff-Norton Co.
EISENHUTTE PRINZ RUDOLPH, A.G.
FLOTTMAN-WERKE G.M.B.H.
FRASER & CHALMERS ENG. WKS.
Gutehoffnungshutte, A.G.
Joy-Sullivan Ltd.
Mayo Tunnel & Mine Equipment
Texas Gulf Sulphur Co.
Vickers-Armstrongs (Engineers) Ltd.
Washington Iron Works
John Wood & Sons, Ltd.

MINE SHAFT HOISTS Drum

ALIMAK-VERKEN AB
ASEA, SWEDEN
Ateliers de Constructions Electriques de Charleroi
ATLAS COPCO INC.
ATLAS COPCO AB, SWEDEN
Austin Hopkinson & Co. Ltd.
BLACK'S MNG. EQUIP., LTD.
Clyde Iron Wks. Inc.
Coeur d'Alene Hardware & Foundry Co.
Demag Aktiengesellschaft
EISENHUTTE PRINZ RUDOLPH, A.G.
Electric Controller & Mfg. Co.
FRASER & CHALMERS ENG. WKS.
GARDNER-DENVER CO.
GENERAL ELECTRIC CO. LTD., THE
Gregg Co., Ltd.
Gutehoffnungshutte, A.G.
Hirsch Bros. Machinery Co.
Hitachi Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Kema (Kohn-Ehrenfelder Maschinenbau-Anstalt)
LAKE SHORE, INC.
McDowell Co., Inc.
NORDBERG MFG. CO.
The Nolan Co.
Ohio Hoist & Mfg. Co.
Rogers Iron Works Co.
Shepard Niles Crane & Hoist Corp.
STEARNS ROGER MFG. CO.
TELLURIDE IRON WKS.
Texas Gulf Sulphur Co.
THOR POWER TOOL CO.
Vickers-Armstrongs (Engineers) Ltd.
Vulcan-Denver—See Vulcan Iron Works
Vulcan Iron Works
Washington Iron Wks.
Western Gear Corp. (Calif.)
John Wood & Sons, Ltd.
Yuba Consolidated Industries, Inc.

Keeps

ASEA
EISENHUTTE PRINZ RUDOLPH, A.G.

SCRAPER HOISTS (slushers) Portable

American Chain & Cable Co., Inc.
Wright Hoist Div.
American Hoist & Derrick Co.
ATLAS COPCO INC.
ATLAS COPCO, A. B., SWEDEN
Austin Hopkinson & Co. Ltd.
Brownlie—see Sanford Day Iron Works, Inc.
Cecalt S. A.—See Grip Hoist, Inc.
CHICAGO PNEUMATIC TOOL CO.
Clyde Iron Wks.
Connellsville Mfg. & Mine Supply Co.
Consolidated Pneumatic Tool Co., Ltd.
EIMCO CORP., THE
GARDNER-DENVER CO.
Grip Hoist, Inc.
HARNISCHFEGGER CORP.
Hasenclever (Maschinenfabrik) A.G.
HOLMAN BROS. LTD. (ENG. LAND)
Holmac Bros. (Canada) Ltd.
Hopkinson & Co. Ltd. Austin
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Joy-Sullivan Ltd.
Ledeen Mfg. Co.
Lug-All Co., The
John Mills & Co.
Mixersville Mfg. Inc.
National Supply Co. (Pa.)
Ohio Hoist & Mfg. Co.

Princeton Grip Hoist, Inc.
Round Chain Co's.
Sanford Day Iron Wks.
Scoombmobile—see Mixermobile Mfg. Inc.
Shepard Niles Crane & Hoist Corp.
THOR POWER TOOL CO.
Uhrden, Inc.
Vulcan-Denver—Vulcan Iron Works, Denver, Colo.
Vulcan Iron Works (Pa.)

Stationary

American Chain & Cable Co., Inc.
Wright Hoist Div.
American Hoist & Derrick Co., Inc.
ATLAS COPCO, A. B., SWEDEN
ATLAS COPCO INC.
Austin Hopkinson & Co. Ltd.
Beebe Bros.
Connellsville Mfg. & Mine Supply Co.
Clyde Iron Wks. Inc.
EISENHUTTE PRINZ RUDOLPH, A.G.
Eisenwerke Mulheim Meiderich, A.G.
GARDNER-DENVER CO.
Gar Wood Industries, Inc.
Gregg Co., Ltd.
HARNISCHFEGGER CORP.
Hitachi Ltd.
HOLMAN BROS. LTD.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Joy-Sullivan Ltd.
LAKE SHORE INC.
John Mills & Co.
NATIONAL IRON CO.
National Supply Co. (Pa.)
Ohio Hoist & Mfg. Co.
Round Chain Co's.
Sanford Day Iron Wks.
SAUKERMAN BROS., INC.
Shepard Niles Crane & Hoist Corp.
STEARNS ROGER MFG. CO.
Vulcan-Denver—See Vulcan Iron Works, Denver, Colo.
Vulcan Iron Works (Denver)
Washington Iron Works

SKIPS AND CAGES

Allison Steel Mfg. Co.
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE
ASEA, SWEDEN
Atlas Car & Mfg. Co., The
Barker, Davies & Co.
CARD IRON WORKS CO., THE C. S.
Simon Carves Ltd.
Clyde Iron Works, Inc.
Coeur d'Alene Hardware & Foundry Co.
Connellsville Mfg. & Mine Supply Co.
Demag Aktiengesellschaft
Easton Car & Construction Co.
Gregg Co., Ltd.
Gutehoffnungshutte, A.G.
HACK ENGINEERING CO.
HEAD WRIGHTSON, STOCKTON FORGE, LTD.
Hirsch Bros. Machinery Co.
Jeffrey Mfg. Co.
JETO-SKIP—SEE LAKE SHORE, INC.
LAKE SHORE, INC.
MACHINERY CENTER INC.
Marcar & Co. Ltd., Alexander
Mayo Tunnel & Mine Equip.
McDowell Co., Inc.
Miners Foundry & Mfg. Co.
NATIONAL IRON CO.
Nolan Co., The
NORDBERG MFG. CO.
Ogden Iron Works Co.
Ohio Hoist & Mfg. Co.
Rogers Iron Works Co.
Sanford-Day Iron Works Inc.
Sheepbridge Equip. Ltd.
STEARNS ROGER MFG. CO.
RICHARD SUTCLIFFE LTD.
TELLURIDE IRON WORKS CO.
Universal Dredge Mfg. Co.
Vickers-Armstrongs (Engineers) Ltd.
Vulcan-Denver—See Vulcan Iron Works, Denver, Colo.
Vulcan Iron Works (Colorado)
Vulcan Iron Works (Pa.)
WEDAG
Wellman Engineering Co., The

HOSE

Air Reduction Sales Co.
Alumite Div., Stewart-Warner

American Biltrite Rubber Co., Boston Woven Hose & Rubber Div.
American Rubber Mfg. Co.
ATLAS COPCO, A. B., SWEDEN
ATLAS COPCO INC.
Band-It Co.
Bonded Scale & Machine Co.
Boston Woven Hose & Rubber Co.
Buck & Associates, Carl
Carlyle Rubber Co., Inc.
CHICAGO PNEUMATIC TOOL CO.
Clearstream-Garden—see Yardley Plastics Co.
Davey Compressor Co.
EIMCO CORP., THE
GATES RUBBER CO., THE
GOODALL RUBBER CO.
GOODRICH CO., R. F., INDUS. TRIAL PROD. DIV.
Goodyear Tire & Rubber Co.
GOODYEAR INTERNATIONAL CORP.
HEWITT-ROBINS, INC.
HOLMAN BROS. LTD. (ENG. LAND)
Industrial Air Prod. Co.
Ingersoll Rand Co. Ltd.
INTERNATIONAL B. F. GOODRICH
JOY MFG. CO.
Lee Rubber & Tire Corp., Republic Rubber Div.
Lincoln Engineering Co.
Olin Mathieson Chemical Corp.
Mine Safety Appliances Co.
NATIONAL MINE SERVICE CO.
Porter Co., H. K., Quaker Rubber Div.
Quaker Pioneer Rubber Mills
Raybestos—Manhattan, Inc.
Republic Rubber Div., Lee Rubber & Tire Corp.
Stenberg Corp. of Canada Ltd.
Stewart-Warner Corp., Alemtite Div.
Tamping Bag Co., Div., Pickard Industries, Inc.
Thermoid Rubber Co.
THOR POWER TOOL CO.
United States Rubber Co.
U. S. Rubber Inc.
Westinghouse Air Brake Co., Le
Boi Div.
Yardley Plastics Co.
Yosemite—see American Rubber & Mfg. Co.

HOSE FITTINGS, CLAMPS, COUPLINGS

Alemtite Div., Stewart-Warner Corp.
Band-It Co.
Carlyle Rubber Co., Inc.
CHICAGO PNEUMATIC TOOL CO.
GOODRICH CO., INTERNATIONAL B.F.
GOODYEAR INTERNATIONAL CORP.
HEWITT-ROBINS, INC.
HOLMAN BROS. LTD.
Hose Accessories Company
Ingersoll-Rand Co., Ltd.
Mine Safety Appliances Co.
NATIONAL MINE SERVICE CO.
THOR POWER TOOL CO.
Victaulic Co. of America

HYDROSEPARATORS

See Thickeners and Tanks; Classifiers

IDLERS

See Conveyor Equipment

INCREASERS, SPEED

See Speed Changers

INSTRUMENTS

See Engineering Supplies; Surveying Instruments; Controls

ION EXCHANGE RESINS

See Reagents and Chemicals

JIGS

See Concentrating Equipment

JIM CROWS

See Track and Accessories

JUMBOS

See Drills, Rock

KILNS

See Dryers and Kilns; Coolers

LABORATORIES AND ASSAYERS

ABBOTT HANKS, INC.
 Agents Miners & Maritimes S. A.
ARIZONA TESTING LABORATORIES
 Beckman Instruments, Inc.
BENNETTS CHEMICAL LABORATORY, INC.
 Black & Denson
 Booth Co., Inc.
 Braun Chemical Co.
 Braun-Knecht-Heimann Co.
 Carpeo Mfg. Inc.
 Central Scientific Co.
CHAPMAN, WOOD & GRISWOLD
COLORADO ASSAYING CO., THE
 Degendorfer, T. G.
DENVER EQUIPMENT CO.
DICKINSON LABORATORIES, INC.
 El Paso Testing Laboratories
 Engineers Syndicate, Ltd.
 Galigher Co., The
GENERAL ELECTRIC CO. LTD.
 Goodall Bros.
HANKS, INC., ABBOTT A.
 Hawley & Hawley
 Imperial Chemical Industries, Ltd.
 Junction Bit & Tool Co.
 Kennedy-Van Saun Mfg. & Eng. Corp.
 Knapp & Bates, Ltd.
 Ledoux & Co.
 Lerch Bros., Inc.
 Mack, Peter
 Menlo Research Lab.
 Metallurgical Engineers, Inc.
 Minerals Engineering Co.
 Minerals Laboratory
 Mobile Drilling, Inc.
 Ore Research & Laboratories
 Osborne Laboratories, Inc., Raymond G.
 Phillips Electronics, Inc., Instruments Div.
REED ENGINEERING
 Research Inc.
 Root & Simpson, Inc.
 Smith-Emery Co.
 Snell Inc., Foster D.
 Southern Spectrographic Laboratory
SOUTHWESTERN ENGINEERING CO.
 Stearns Magnetic, Inc.
STURTEVANT MILL CO.
 Udy, Marvin J.
WOOD ASSAYING CO., HENRY E.

LABORATORY EQUIPMENT AND SUPPLIES

See also Reagents and Chemicals

Laboratory and Testing Machines

Agital—see Galigher Co., The
 Ainsworth & Sons, Inc., Wm.
 Ainsworth Balances—see Ainsworth & Sons, Inc.
 Associated Electrical Industries Ltd.
 Atkins Technical Inc.
BALDWIN-LIMA-HAMILTON CORP.
 Bausch & Lomb Optical Co.
 Beckman Instruments, Inc., Scientific Instruments Div.
 Bleo, Inc.
 Booth Co., Inc.
 Braun-Knecht-Heimann Co.
 Carpeo Mfg., Inc.
 Central Scientific Co.
 Davison & Co. (Hexham) Ltd.
DENVER EQUIPMENT CO.
DFC—SEE DENVER FIRE CLAY CO., THE
DICKINSON LABORATORIES, INC.
 Dings Magnetic Separator Co.
 Engineers Syndicate, Ltd.
 Galigher Co.
GENERAL ELECTRIC CO., INTERNATIONAL
GENERAL ELECTRIC CO. LTD.
 General Mach. Co.

HARDINGE CO., INC.
HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ AG
 Humphreys Investment Co.
 International Combustion Ltd.
 Knapp & Bates, Ltd.
 Ledoux & Co.
 Leeds & Northrup Co.
 Lerlab Supply Co.
 Le Grand Sutcliffe & Gell Ltd.
 Liquid-Solid Separations Ltd.
 MacBeth Inst. Corp.
MASSCO—SEE MINE & SMELTER SUPPLY CO.
 Menlo Research Laboratory
MINE & SMELTER SUPPLY CO.
 Minerals et Metaux
 Morgordshammars Mek. Verkstad A.B.
 Morse Bros. Machinery Co.
 Nucleonic Corp. of America
 Philips Electronic Instruments
 Photovolt Corp.
 Precision Radiation Inst., Inc.
 Pulva Corp.
 Pyrometer Instrument Co., Inc.
 Rawson Electrical Inst. Co.
RO-TAP—SEE TYLER CO., THE W.S.
 Sapor Microsplitter Supply
SOUTHWESTERN ENGINEERING CO.
 Staplex Co., The
 Stearns Magnetic, Inc.
STURTEVANT MILL CO.
 Torsion Balance Co., The
TY-LAB—SEE TYLER CO., THE W.S.
TYLER CO., THE W.S.
 Ultra Violet Prod., Inc.
 Universal Vibrating Screen Co.
 Voland & Sons, Inc.
 WEDAG
WEMCO—SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.
 Wheel Trueing Tool Co.

MISCELLANEOUS LABORATORY SUPPLIES

Allied Chem. Corp., General Chem. Div.
 Atkins Technical, Inc.
 Baker & Adamson—see Allied Chemical Corp., General Chem. Div.
 Bausch & Lomb Optical Co.
 Bleo, Inc.
 Booth Co., Inc., The
 Braun-Knecht-Heimann Co.
 Carpeo Mfg., Inc.
 Carrier Corp.
 Central Scientific Co.
 Combustion Engineering Inc., Raymond Div.
DFC—SEE DENVER FIRE CLAY CO.
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO.
 Engineers Syndicate, Ltd.
 Fischer & Porter Co.
GENERAL ELECTRIC CO. LTD.
 Heri-Duty Electric Co.
 Hoffman Bros. Drilling Co.
INDUSTRIAL PHYSICS & ELECTRONICS CO.
 International Combustion, Ltd.
 Knapp & Bates, Ltd.
 Lerch Brothers Inc.
 Lerlab Supply Company
 Menlo Research Lab.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
 Nucleonic Corp. of America
 Rapid Magnetic Machines, Ltd.
 Snyder's Mine & Chemical Lab
STURTEVANT MILL CO.
 Ultra-Violet Products, Inc.

LACING, BELT

See Fasteners, Belt

LAMPS, MINER

See Safety Equipment

LIGHT PLANTS

See Electrical Equipment

LIGHTS

See Safety Equipment

LINERS

See Grinding Equipment

LOADERS, FRONT END AND OVERHEAD

See also Tractors and Attachments; Self-Loading Transport; Train Loader Systems

CRAWLER

ALLIS-CHALMERS MANUFACTURING CO., CONST. MACHY. DIV.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
ATLAS COPCO, A.B. SWEDEN
 Austin-Western—see Baldwin-Lima-Hamilton Corp.
BALDWIN-LIMA-HAMILTON CORP.
 Barber-Greene Co.
 Caterpillar Tractor Co.
 John Deere Industrial Div.
 Drott Mfg. Co.
EMCO CORP., THE
 Goodman Mfg. Co.
HARNISCHFEGGER CORP.
 Hough Co., The, Frank G.
INTERNATIONAL HARVESTER COMPANY
INTERNATIONAL HARVESTER EXPORT CO.
 Jeffrey Mfg. Co., The
 Joost Manufacturing Co.
JOY MANUFACTURING CO.
 Joy-Sullivan Ltd.
 Koehring Company
 Lodoover—see Service Supply Co.
MARION POWER SHOVEL CO.
 Minneapolis-Moline Co.
 Oliver Corp., The
 Rogers Iron Works Inc.
SALZGITTER MASCHINEN AKTIENGESELLSCHAFT
 Sanford Day Iron Wks.
 Service Supply Corp.
 Sheenbridge Engineering Ltd.
 Skid-Shovel—see Drott Mfg. Corp.
 Tractomotive Corp.
 Tracto-Shovel—see Tractomotive Corp.
 Traxcavator—see Caterpillar Tractor Co.
 Vickers-Armstrongs (Tractors) Ltd.
 Washington Iron Works

GATHERING ARM

Goodman Mfg. Co.
INTERNATIONAL HARVESTER
 Jeffrey Mfg. Co., The
JOY MFG. CO.
 Joy-Sullivan Ltd.

RAIL (Mucking Machines)

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
ATLAS COPCO, A.B., SWEDEN
ATLAS COPCO INC.
BALDWIN-LIMA-HAMILTON CORP.
EMCO CORP., THE
GARDNER-DENVER CO.
 Goodman Mfg. Co.
 Joy-Sullivan Ltd.
SALZGITTER MASCHINEN AKTIENGESELLSCHAFT

RUBBER-TIRED

W. G. Allen & Sons, Ltd.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 American M.A.N. Corp.
ATLAS COPCO, A.B.
 Austin-Western—see Baldwin-Lima-Hamilton Corp.
 Barber-Greene Co.
 Boydeil, E., & Co. Ltd.
 Chasacide Engineering Co. Ltd.
CLARK EQUIPMENT CO.
 John Deere Industrial Div.
EUCALID DIVISION, GENERAL MOTORS CORP.
HOUGH—SEE INTERNATIONAL HARVESTER EXPORT CO.
 Hough Co., Frank G.
 Hunslet Engine Co.
INTERNATIONAL HARVESTER EXPORT CO.
 Jaeger Machine Co., The
 Jeffrey Mfg. Co., The
 Kaelble, G.m.b.H., Carl
MICHIGAN—SEE CLARK EQUIPMENT CO.
 Minneapolis-Moline Co.
 Mixermobile Mfg. Inc.
 Napco Industries, Inc.
NATIONAL IRON CO.
 Oliver Corp., The
 Pettibone Mulliken Corp.
 Quaker Pioneer Rubber Mills
 Sheepbridge Engineering Ltd.
SOUTHWEST ENGINEERING CO.
 Speedall—see Pettibone Mulliken Corp.
 Thew Shovel Co.
 Tractomotive Corp.
 Washington Iron Works
 Westfall Equipment Company Inc.
 Westinghouse Air Brake Co.

LOCOMOTIVES**BATTERY**

Atlas Car & Mfg. Co., The
BALDWIN-LIMA-HAMILTON CORP.
 English Electric Export & Trading Co., Ltd.
 Gen. Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
 G.E. Locomotive Div.
 Goodman Mfg. Co.
 Greensburg Machine Co.
 Greenwood & Batley Ltd.
 Hitachi Ltd.
 Hunslet Engine Co.
GENERAL ELECTRIC CO., INTERNATIONAL
 Jeffrey Manufacturing Co.
 Mancha Storage Battery Locomotive Div.
 Goodman Mfg. Co.
NATIONAL MINE SERVICE CO.
 Thunes Mek. Verkstad, A. S.
 Wingrove & Rogers Ltd.
 Wood & Co. Ltd., Hugh
 Wood & Sons Ltd., John

COMPRESSED AIR

Demag Aktiengesellschaft
EMCO CORP., THE
HACK ENG. CO.
 Mayo Tunnel & Mine Equip.
TRAMMAIRE—SEE HACK ENG. CO.
 Universal Dredge Mfg. Co.
 Universal Tramair—see Universal Dredge Mfg.

DIESEL

American Locomotive Co.
 Clayton Equipment Company
ELECTRO-MOTIVE DIV., GEN. MOTORS CORP.
 Fate-Root-Heath Co., The
GENERAL ELECTRIC CO., INTERNATIONAL
GENERAL MOTORS OVERSEAS OPERATIONS
 Goodman Mfg. Co., Mancha Div.
 Greensburg Mach. Co.
 Greig Co., Ltd., The
HACK ENG. CO.
 Hitachi Ltd.
 Hunslet Engine Co., Ltd., The
KLOCKNER-HUMBOLDT-DEUTZ, A. G.
LE TOURNEAU-WESTINGHOUSE CO.
 Mancha Storage Battery Locomotive Div.
 Goodman Mfg. Co.
 Mannesmann Export G.m.b.H.
 Mayo Tunnel & Mine Equip.
 Miller Machinery Co.
MIRRELES, BICKERTON & DAY, LTD.
 Misocula—see Miller Mach. Co.
 Motor Rail, Ltd.
NATIONAL MINE SERVICE CO.
 North British Locomotive Co.
 Plymouth Locomotive Works
 Rogers Iron Works Co.

Manufacturers' Complete Names and Addresses are listed on the last pages of this yellow section. Advertisers in this issue are listed in boldface capital letters.

Log Washers

ROLLS-ROYCE LTD.
Ruston & Hornsby, Ltd.
Ruth Co., The
SWITCHMOBILE—SEE LE TOUT-NEAU-WESTINGHOUSE CO.
TELLURIDE IRON WORKS CO.
Thunes Mek. Verksted, A. S.
Universal Dredge Mfg. Co.
UNIVERSAL—SEE HACK ENG. CO.
Vulcan Iron Works (Pa.)

DIESEL-ELECTRIC

Alco Products, Inc.
American Locomotive Co.
Atlas Car & Mfg. Co., The
Baldwin-Lima-Hamilton Corp., Eddystone Div.
Brown Boverie & Cie, A.G.
Clayton Equipment Co.
Differential Steel Car Co.
ELECTRO-MOTIVE DIV., GENERAL MOTORS CORP.
Fate-Root-Heath Co., The
General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL MOTORS OVERSEAS OPERATIONS
Greensburg Machine Co.
HACK ENGINEERING CO.
Hitachi Ltd.
MIRRELES, BICKERTON & DAY, LTD.
North British Locomotive Co.
Plymouth—see Fate-Root-Heath Co.
The
Plymouth Locomotive Works
Rogers Iron Works Co.
Ruston & Hornsby Ltd.
Universal Dredge Mfg. Co.
U.S. Industries, Inc.
Vulcan Iron Works (Pa.)

TROLLEY

ASEA, SWEDEN
Atlas Car & Mfg. Co.
Clayton Equipment Co.
Differential Steel Car Co.
General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
Goodman Mfg. Co.
Greenwood & Batley Ltd.
Hitachi Ltd.
Hunslet Engine Co.
INTERNATIONAL B.F. GOOD-RICH CO.
Jeffrey Mfg. Co.
Mancha Storage Battery Div., Goodman Mfg. Co.
NATIONAL MINE SERVICE CO.
Thunes Mek. Verksted, A.S.
Vulcan Iron Works (Pa.)
WESTINGHOUSE ELECTRIC INTERNATIONAL COMPANY
Wingrove & Rogers Ltd.

LOG WASHERS

See Washers

LUBRICANTS

Alemite—see Stewart-Warner Corp.
Amalie—see Sonneborn Sons, Inc., L.
AP5—see Jet-Lube Inc.
Atlantic Refining Co.
CR—see Jet-Lube Inc.
Calol—see Standard Oil Co. of Calif.
Climax Molybdenum Co.
Drucolene—see Drullard Co., Howard
Eso Standard Oil Co.
Fiske Bros. Refining Co., Lubriplate Div.
Fluidwick Co.
General Petroleum Corp.
Gulf Oil Corp., Gulf Refining Co.
Houghton & Co., E. F.
Jet-Lube Inc.
Keystone Lubricating Co.
Kopr-Kote—see Jet-Lube Inc.
Keystone Lubricating Co.
Lead-Cote—see Drullard Co., Howard
Lion Brand—see Monsanto Chemical Co.
Lubriplate—see Fiske Bros. Refining Co., Lubriplate Div.
Macmillan Petroleum Corp.
Molub-Alloy—see Imperial & Grease Co.
Monsanto Chemical Co.
Morocco—see Sahara Oil Co.
OG—see Jet-Lube Inc.
Perma-Film—see Jet-Lube Inc.
Perma-wick—see Fluidwick Co.
Powertane—see Ideas, Inc.
Roder-Blackburn Intl. Corp.

RPM—see Standard Oil Co., of Calif.
Sinclair Refining Co.
Soocon-Vacuum Oil Co.
Sonneborn Sons, Inc., L.
Sta-put—see Houghton & Co., E. F.
Standard Oil Co. of California
Standard Oil Co. (Indiana)
Stewart Warner Corp.
Texas Co.
THOR POWER TOOL CO.
Tide Water Associated Oil Co.
Tycol—see Tide Water Associated Oil Co.
Union Oil of California
U. S. Graphite Co.
VL—see Jet-Lube Inc.
Wrightlube—see Wright Power Saw and Tool Corp.

MACHINE SHOP EQUIPMENT

See Sharpeners

MAGNETIC EQUIPMENT

BRAKES
Eaton Mfg. Co., Dynamatic Div.
DETECTORS
Crucible Steel Co. of America
Dings Magnetic Separator Co.
General Electric Co., Apparatus Sales Division
INDUSTRIAL PHYSICS & ELECTRONICS COMPANY
Magnetic Engineering & Mfg. Co.
Rapid Magnetic Ltd.
Stearns Magnetic Products

HEAD PULLEYS AND SUSPENSION MAGNETS
Crucible Steel Co. of America
Dings Magnetic Separator Co.
E C & M Div. of Square D Co.
Eries Mfg. Co.
FRASER & CHALMERS ENG. WORKS
Homer Mfg. Co., The
HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ A.G.
Johnson, Herbert B.
Memco—see Magnetic Eng. & Mfg. Co.
Ohio Electric Mfg. Co.
Rapid Magnetic Machines, Ltd.
F. W. Shrader Co.
Scott's Concentrators
Stearns Magnetic Products Inc.
Thunes Mek. Verksted, A. S.

SEPARATORS
Carpo Mfg. Co.
Crucible Steel Co. of America
Dings Magnetic Separator Co.
Engineers Syndicate, Ltd.
Eries Mfg. Co.
Exolon Co., The
S. G. FRANTZ CO., INC.
FRASER & CHALMERS ENG. WORKS
General Electric Co., Carboly Dept.
General Electric Co., Metallurgical Products Dept.
Homer Mfg. Co., The
Huntington, Heberlein & Co., Ltd.
Inflico, Inc.
KLOCKNER-HUMBOLDT-DEUTZ, A. G.
Jeffrey-Steffensen—see Jeffrey Mfg. Co., The
Jeffrey Manufacturing Co.
Johnson, Herbert Banks
JOY MANUFACTURING CO.
Knapp & Bates, Ltd.
KRUPP, FRIED MASCHINEN UND STAHLBAN RHEINHAUSEN
LURGI GMBH
Magnetic Engineering & Mfg. Co.
Memco—see Magnetic Engineering & Mfg. Co.
Rapid Magnetic Ltd.
Research-Gottrell, Inc.
Sanford Day Iron Works, Inc.
Scott's Concentrators
Thunes Mek. Verksted, A. S.
WEDAG (WESTFALIA DINNEN-DAHL GROPPPEL AG)

MILL DESIGN

See Plant Design

MINE CARS

See Cars, Mine

MINE DOORS

See Doors, Mine

MINE SAFETY EQUIPMENT

See Safety Equipment

MINE SUPPORT

See also Timber

HYDRAULIC PROPS

B-R-D CO., LTD.
Bethlehem Steel
Dowty Mining Equipment Ltd.
Gutehoffnungshutte, A.G.
Hemseheidt, Hermann

MONITORS (HYDRAULIC)

Chiksan Co.
FRASER & CHALMERS ENG. WORKS
Hydraulic Supply Mfg. Co.
Intelli-Giant—see Chiksan Co.
Hemseheidt, Hermann
Yuba Mining Div. Yuba.
Consolidated Industries, Inc.

MOTORS

See also Engines; Electrical Equipment; Locomotives

AIR MOTORS

ALIMAK CORP.
ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO, INC.
Brown Boverie & Cie A. G.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co. Ltd.
Coppus Engineering Corp.
Demag Aktiengesellschaft
EIMCO CORP., THE
GARDNER-DENVER CO.
GRAYBAR ELECTRIC CO., INC.
HOLMAN BROS. LTD.
Holman Brothers (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Leden Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
PISTONAIR—SEE JOY MFG. CO.
H. K. Porter Co., Inc.
SAKZGITTER MASCHINEN AKTIENGESellschaft
THOR POWER TOOL CO.
TURBINAIR—SEE JOY MFG. CO.
Westinghouse Air Brake Co. Le Roi Div.
WESTINGHOUSE ELEC. INTL. CO.

GEAR MOTORS

Allis Co., The Louis
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ASEA, SWEDEN
Brown Corp. (Sales) Ltd., David
BROWN, INC. DAVID
Brown Industries Ltd., David
Christian Engineers, J. D.
Coear d'Alene Hardware & Foundry Co.
Eaton Manufacturing Co., Dynamic Div.
EIMCO CORP., THE
Fairbanks, Morse & Co.
Falk Corp., The
General Dynamics Corp., Electro
Dynamic Div.
General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC, INT'L.
General Motors Corp., Delco Products Div.
GENERAL MOTORS OVERSEAS OPERATIONS
GRAYBAR ELECTRIC CO., INC.
HEWITT-ROBINS, INC.
Hillman Co., Inc., C. Kirk
Howell Elec. Motors Co.
Lima Electric Motor Co., The
Link-Belt Co.
Master Electric Co., The
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Morse Chain Co.

Motoreducers—see Falk Corp., The
Pacific Gear & Tool Works, Inc.
Philadelphia Gear Works, Inc.
Reliance Electric & Engineering Co.
Sterling Electric Motors, Inc.
U.S. Electrical Motors, Inc.
Wagner Electric Corp.
Western Gear Corp., (Calif.)
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

HYDRAULIC MOTORS

AMERICAN BRAKE SHOE CO.
Berry—see Oliver Iron & Steel Corp.
Commercial Shearing & Stamping Co.
Oliver Iron & Steel Corp.

MUCKING MACHINES

See Loaders; Shaft Sinking Equipment

NODULIZING

See Pelletizers and Nodulizers

NOZZLES

See Screens, Grizzlies and Accessories

OILERS, AIR LINE

Alemite Div., Stewart-Warner Corp.
ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO INC.
Black Widow—see Bean Rubber Mfg. Co.
Bohler Bros. & Co. Ltd.
CHICAGO PNEUMATIC TOOL CO.
Cleveland Vibrator Co.
Consolidated Pneumatic Tool Co., Ltd.
EIMCO CORP., THE
FLOTTMAN-WERKE, G.m.b.H.
GARDNER-DENVER CO.
HOLMAN BROS. LTD.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Lincoln Engineering Co.
Schramm, Inc.
Standard Oil Co. of Calif.
Stewart-Warner Corp., Alemite Div.
THOR POWER TOOL CO.
Watts Regulator Co.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.
Wright Power Saw & Tool Corp.

OILS

See Lubricants; Reagents and Chemicals

ORE TESTING SERVICES

ARIZONA TESTING LABORATORIES
Baker Perkins Ltd.
Booth Co., Inc., The
Carpo Mfg. Inc.
DENVER EQUIPMENT CO.
Dunham Gordon Mfg. & Sales Co.
FRASER & CHALMERS ENG. WORKS
Galagher Co., The
GENERAL ELEC. CO., LTD., THE
HANES, INC., ABBOTT A.
Johnson, Herbert Banks
Kennedy-Van Saun Eng. & Mfg. Corp.
KLOCKNER-HUMBOLDT-DEUTZ, A. G.
Knapp & Bates, Ltd.
Ledoux & Co.
McDowell Co., Inc. Dwight Lloyd Divan.
Minerals Engineering Co.
Mobile Drilling, Inc.
Nucleonic Corp. of America
Osborne Laboratories, Inc., Raymond G.
Rapid Magnetic Machines, Ltd.
SOUTHWESTERN ENGINEERING CO.
TELLURIDE IRON WORKS CO.
Tracerlab, Inc.
WESTERN MACHY CO.

OXYGEN BREATHING APPARATUS

See Safety Equipment

PACKING

GOODALL RUBBER CO.
GOODRICH CO., B. F. INDUS.
PROD. DIV.
GOODYEAR INTERNATIONAL
CORP.
Goodyear Tire & Rubber Co.
HEWITT-ROBINS, INC.
INTERNATIONAL B. F. GOOD-
RICH
Thermoid Rubber Co.

PELLETIZERS

DRUM
HARDINGE CO., INC.
Kennedy-Van Saun Mfg. & Engr.
Co.
STANDARD STEEL CORP.
DISC
HARDINGE CO., INC.
PLANTS
LURGI GMBH

PIPE AND FITTINGS

See also Couplings

ASBESTOS
Armco Drainage & Metal Products,
Inc.
Johns-Manville Sales Corp.
PACIFIC PIPE CO.
Philip Carey Mfg. Co., The
Transite—see Johns-Manville
U. S. Rubber Co.

CAST AND STEEL
AMERICAN MANGANESE STEEL
DIV., AMER. BRAKE SHOE
CO.

American Locomotive Co.
Armco Drainage & Metal Products,
Inc.
ATLAS COPCO INC.
Bethlehem Steel
Calumet & Hecla, Inc., Calumet Div.
Crane Co.
Cruible Steel Co. of America
Electric Steel Foundry Co.
Grinnell Co., Inc.
Hadfields Ltd.
Kaiser Steel Corp.
Lead Lined Iron Pipe Co.
Mannesmann Export G.m.b.H.
McNally Pittsburgh Co.
Michigan Pipe Co.
Mills Iron Wks., Inc.
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
NATIONAL IRON CO.
National Supply Co., The
PACIFIC PIPE CO.
Republic Steel Corp.
Ruston & Hornsby, Ltd.
Stewarts & Lloyds Ltd.
Taylor Forge & Pipe Works
United States Steel Corp., Columbia
Geneva Div.
UNITED STATES STEEL EXPORT
CO.
Vietaulic Co. of America
Walworth Co.
Western Foundry Co.
Youngstown Sheet & Tube Co., The

PLASTIC
Amercoat Corp.
BARBER-WEBB CO., INC.
British Insulated Callender's Cable
Ltd.
Carton Products Corp.
Colonial Plastic Mfg. Co.
Crane Co.
Federal Pipe & Tank Company
Fischer & Porter Co.
GATES RUBBER CO., THE
GOODALL RUBBER CO.
GOODRICH CO., B. F. INDUS-
TRIAL PROD. DIV.
Grinnell Co., Inc.
INTERNATIONAL B. F. GOOD-
RICH CO.
KRALOY PLASTIC PIPE CO., INC.
Michigan Pipe Co.
Minnesota Mining & Mfg. Co.
Irvington Varnish & Insulator,
a Div.

National Tank & Pipe Co.
PACIFIC PIPE CO.
H. K. Porter Co., Inc.
Quaker Pioneer Rubber Mills
Republic Steel Corp.
Ryerson & Son, Inc., Joseph T.
Stewarts & Lloyds Ltd.
Thermoid Rubber Co.
Trabon Eng. Co.
United States Rubber Co.
U. S. Steel Corp., Columbia-Geneva
Div.
United States Steel Corp.
UNITED STATES STEEL EXPORT
CO.
Vietaulic Co. of America
Walworth Co.
Yardley Plastics Co.
Youngstown Sheet & Tube Co., The

RUBBER LINED
BARBER-WEBB CO., INC.
Crane Co.
GOODALL RUBBER CO.
GOODRICH CO., B. F. INDUS-
TRIAL PROD. DIV.
Goodyear International Corp.
INTERNATIONAL B. F. GOOD-
RICH
Michigan Pipe Co.
NAYLOR PIPE CO.
PACIFIC PIPE CO.
H. K. Porter Co., Inc.
Quaker Pioneer Rubber Mills
Raybestos-Manhattan, Inc.
Thermoid Co.
U. S. Rubber Co.
Vietaulic Co. of America
Wilkinson Rubber Linatex, Ltd.

STEEL, SPIRAL-WELDED
A. B. Alvenius Industrier
Armco Drainage & Metal Products,
Inc.
Armco Steel Corp.
Hydraulic Supply Mfg. Co.
Lead Lined Iron Pipe Co.
NAYLOR PIPE CO.
PACIFIC PIPE CO.
Taylor Forge & Pipe Wks.
U. S. Steel

WOOD
Federal Pipe & Tank Co.
Michigan Pipe Co.
National Tank & Pipe Co.
PACIFIC PIPE CO.
SANTA FE TANK DIV., FLOUR
PRODUCTS CO.
Sutphen, Peter O.

PLANT DESIGN AND CONSTRUCTION

Allen and Garcia Co.
Aluminum Co. of America
BALDWIN-LIMA-HAMILTON
CORP.
Barber-Greene Co.
Baukol, Philip J.
Booth Co., Inc., The
Braun & Co., C. F.
Carpeo Mfg. Inc.
CHAPMAN, WOOD & GRISWOLD
COWIN & CO., INC.
Davison & Co., (Hexham) Ltd.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
Dorr-Oliver G.m.b.H.
Dravo Corp.
Fisher Contracting Co.
EIMCO CORP., THE
Foster Wheeler Corp.
FRASER & CHALMERS ENG.
WORKS
Galigher Co.
GOULD & CO., GORDON I.
Gutshofnungshutte, A.G.
HACK ENGINEERING CO.
Head Wrightson Colliery Engineer-
ing Ltd.
HEAD WRIGHTSON STOCKTON
FORGE
HEWITT-ROBINS, INC.
Heyl & Patterson, Inc.
Hirsch Bros. Machine Co., Inc.
Johnson & Phillips, Ltd.
Kaiser Engineers
Kellogg Company, The M. W.
Kennedy-Van Saun Mfg. Eng. Corp.
KLOCKNER-HUMBOLDT-
DEUTZ, A. G.
Knapp & Bates, Ltd.
Koppers Co., Inc.
Link-Belt Co.
Lintz, Mark
Loesche, Germany
LOWEY-HYDROPRESS—SEE
BALDWIN-LIMA-HAMILTON
CORP.
LONGYEAR CO., E. J.
LURGI-ES. FUR CHEMIE &
HUETTENWESEN G.m.b.H.

MACE CO., THE
Mayo Tunnel & Mine Equip.
McDowell Co., Inc.
Menlo Research Lab.
Minerals et Metaux
NATIONAL IRON CO.
Nichols Engineering & Research Co.
Osborn Laboratories Inc., Ray-
mond G.
Osmose Wood Preserving Co. of
America, Inc.
Paxman Co. Ltd., Davay
Pioneer Eng. Div., Poor & Co., Inc.
Roberts & Schaefer Co.
Smith Engineering Works
Snell Inc., Foster D.
SOUTHWESTERN ENGINEERING
CO.
STANDARD STEEL CORP.
STEARNS-ROGER MFG. CO.
STILL & STILL
TELLURIDE IRON WORKS CO.
Timber Engineering Co.
TREADWELL CO., INC., M. H.
U. S. Steel Corp.
Universal Dredge Mfg. Co.
Walvoord, Inc., O.W.
West Chester Chemical Co.
Western Knapp Engineering Co.
WESTERN MACH. CO.
Wharton Engineers, Ltd.
Wilmut Eng. Co.
WISSER & COX
World Mining Consultants, Inc.
Yuba Consolidated Industries, Inc.

PNEUMATIC CONCRETING PLACING

Air Placement Equip. Co.
Cement Gun Co.
The Cementation Corp.
Construction Machinery Co.
EIMCO CORP., THE
Gunite—see Cement Gun Co.
HOLMAN BROS. LTD., INC.
Mayo Tunnel & Mine Equipment
Torkret G.m.b.H.

PULLEYS

See also Magnetic Equipment
AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Bonded Scale & Machine Co.
Chain Belt Co.
Continental Conveyor & Equipment
Co.
Curve Crown—see Stephens-
Adamson Mfg. Co.
Dings Magnetic Separator Co.
Dodge Mfg. Co.
Eberhard Bauer, G.m.b.H.
Eriez Mfg. Co.
GATES RUBBER CO., THE
GENERAL ELECTRIC CO. LTD.
General Motors Corp., New De-
parture Div.
HEWITT-ROBINS, INC.
Hirsch Bros. Machine Co., Inc.
Homer Mfg. Div.
HUMBOLDT, KLOCKNER-HUM-
BOLDT-DEUTZ AG
Internaldne—see Yuba Mfg. Co.
Iowa Mfg. Co.
Jeffrey Manufacturing Co.
John Wood & Sons, Ltd.
Link-Belt Co.
Lippmann Engineering Works
Magnetic Eng. & Mfg. Co.
NATIONAL IRON CO.
Rapid Magnetic Ltd.
Sanfor Pulley Co.
Sanford-Day-Iron Works Inc.
Sheepbridge Equip. Ltd.
SKOOKUM CO., INC., THE
Stearns Magnetic Products
Stephens-Adamson Mfg. Co.
TELLURIDE IRON WORKS CO.
Texas Gulf Sulphur Co.
Wedge-Gripp—see Christian En-
gineers, J.D.
Western Foundry Co.
Western Gear Works
Wigglesworth & Co., Ltd., Frank
Worthington Corp.
Yuba Mining Co.

PULVERIZERS

See also Crushers: Grinding
Equipment: Laboratory Supplies
ALLIS-CHALMERS MFG. CO.
Baker Perkins Ltd.
Bethlehem Steel Co., Pacific Coast
Div.
Bico Inc.

Combustion Engineering Inc. (Ray-
mond Div.)
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO.
Foster Wheeler Corp.
GENERAL ELECTRIC CO. LTD.
HARDINGE CO., INC.
HAZEMAG USA, INC.
HUMBOLDT, KLOCKNER-HUM-
BOLDT-DEUTZ AG
International Combustion Products
Ltd.
Iowa Mfg. Co.
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. & Engr.
Corp.
Knapp & Bates Ltd.
Lippman Engr. Works.
Loesche Hartzerkleinerungs und
Zement-maschinen ("Loesche
Mills")
Sheepbridge Equip. Ltd.
SMITH & CO., F. L.
SOUTHWESTERN ENGR. CO.
STURTEVANT MILL CO.
Universal Engineering Corp.
Universal Engineering Div., Poor
& Co.
WEDAG (WESTFALIA DINNEN-
BAHL GROEPPEL AG)
Williams Patent Crusher & Pulv.
Co.

PUMPS

ACID
ALLEN-SHERMAN-HOFF PUMP
CO., THE
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.
Amag-Hilpert-Pegnitzhuetten A. G.
AMPCO Metal, Inc.
Ampeo Centrifugal Pumps — see
Ampeo Metal, Inc.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Barrett, Haentjens & Co.
Belliss & Marcom, Ltd.
BRITISH LABOUR PUMP CO.,
LTD.
Buck & Associates, Carl
Byron Jackson Pumps, Inc.
CENTRISEAL—SEE THE ALLEN-
SHERMAN-HOFF PUMP CO.
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO.
DORR-OLIVER, INC.
Dorr-Oliver G.m.b.H.
Electric Steel Foundry Co.
Fairbanks, Morse & Co.
Food Machinery & Chemical Corp.
Peerless Pump Div.
FRASER & CHALMERS ENG.
WORKS
Galigher Co., The
Galigher Sump Pump—see Galigher
Co., The
GARDNER-DENVER CO.
Hayward Tyler & Co., Ltd.
Hazelton—see Bawett, Haentjens &
Co.
HYDROSEAL—SEE THE ALLEN-
SHERMAN-HOFF PUMP CO.
INGERSOLL-RAND CO.
International Combustion, Ltd.
Jaeger Machine Co., The
Knapp & Bates Ltd.
Mannesmann Export G.m.b.H.
Marlow Pumps—Div. of Bell & Gos-
sett Co.
NAGLE PUMPS, INC.
New York Air Brake Co., The
Aurora Pump Div.
OLIVITE—SEE DORR-OLIVER,
INC.
Peerless Pumps, Inc.
R. O. Stokes & Co., Ltd.
Robbins & Myers, Inc.
Hayward Tyler & Co.
Vacuel—see Galigher Co., The
Vacuel—see International Com-
bustion Ltd.
WESTERN MACH. CO.
WILEY & SONS, INC., A. R.
Wilkinson Rubber Linatex, Ltd.
Worthington Corp.

AIR-DRIVEN
ACKER DRILL CO., INC.
Alemtic Div., Stewart-Warner Corp.
ATLAS COPCO AB, SWEDEN
ATLAS COPCO INC.
Barrett, Haentjens & Co.
Blardon-Durham Co.
BRITISH LABOUR PUMP CO.,
LTD.
Byron Jackson Pumps, Inc.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co.,
Ltd.
GARDNER-DENVER CO.
Hazelton—see Barrett, Haentjens &
Co.

Pyrometallurgical Equipment

HOLMAN BROS., LTD.
INGERSOLL-RAND CO.
 Krogh Pump Co. LaBour Co., Inc.
 The
 Ledeen Mfg. Co.
 Lincoln Engineering Co.
 Mannesmann Export G.m.b.H.
 Schramm, Inc.
 Stewart-Warner Corp., Alomite Div.
THOR POWER TOOL CO.
 Westinghouse Air Brake Co., La
 Roi Div.

FILTRATE

Barrett, Haentjens & Co.

MINE AND DEEP WELL

ALLEN-SHERMAN-HOFF PUMP CO., THE
ALLIS-CHALMERS MFG. CO. INDUSTRIES GROUP
 Amag-Hilbert-Pegnitzhutte A.G.
AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL DIV.
 American M.A.N. Corp.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Barrett, Haentjens & Co.
 Blagdon Durham Ltd.
BRITISH LABOUR PUMP CO., LTD.
 Byron Jackson Pumps, Inc.
CHICAGO PNEUMATIC TOOL CO.
 Crælius Company, Ltd.
 Fairbanks Morse Co.
FOOD MACHINERY & CHEMICAL CORP., JOHN BEAN DIV.
FLYGT—SEE STANCO MFGS. & SALES, INC. AND STENBERG MFG. CORP. OF CANADA LTD.
GARDNER-DENVER CO.
 Hayward Tyler & Co., Ltd.
 Haselton & Pleuger—see Barrett, Haentjens & Co.
 Hitachi Ltd.
INGERSOLL-RAND CO.
 International Combustion Ltd.
 Jaeger Machine Co., The
 Johnston Pump Co.
 La Bour Co., Inc., The
 Mannesmann Export G.m.b.H.
 Morris Machine Works
MOTORAMIC INC.
 Moyno—see Robbins & Myers, Inc.
 National Supply Co. (Pa.)
 New York Air Brake Co., The
 Aurora Pump Div.
 Peerless Pump Div.
 Pegson Ltd.
 Pleuger, Unterwasserpumpen
 Pumps, Inc.
 Rice Pump & Mach. Co.
 Robbins & Myers, Inc.
SALZGITTER MASCHINEN AKTIENGESELLSCHAFT
 Sanford Day Iron Works
STANCO MFG. & SALES, INC.
 Standard Elec. Mfg. Co., Inc.
 Stenberg Corporation A/B
 Stenberg Corp. of Canada Ltd.
 Svenska Motorbör AB
 Hayward Tyler & Co.
 Turbo-Maschinen A.G.
WEDA. SEE MOTORAMIC, INC. & SVENSKA MOTORBÖR
 Wedag A.G.
 Worthington Corp.

PISTON

ACKER DRILL CO., INC.
 Failing Co., Geo. E.
FOOD MACHINERY & CHEM. CORP., JOHN BEAN DIV.
GARDNER-DENVER CO.
 Greenwood & Batley Ltd.
 Sanford Day Iron Works, Inc.

SAND AND SLIME

ACEC
ALLEN-SHERMAN-HOFF PUMP CO., THE
ALLIS-CHALMERS MFG. CO. INDUSTRIES GROUP
 Amag-Hilbert-Pegnitzhutte A. G.
AMERICAN MANGANESE STEEL DIV., AMER. BRAKE SHOE CO.
AMERICAN BRAKE SHOE CO. EXPORT DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Aveling-Barford, Ltd.
 Barrett, Haentjens & Co.
BRITISH LABOUR PUMP CO., LTD.
 Carpeo Mfg. Inc.
CENTRISEAL—SEE THE ALLEN-SHERMAN-HOFF PUMP CO.
CHICAGO PNEUMATIC TOOL CO.
 Consolidated Pneumatic Tool Co., Ltd.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
 Dorr-Oliver G.m.b.H.

Erie—see Erie Pump & Engine Works
 Erie Pump & Engine Works
FLYGT—see Stenberg Corp. of Canada Ltd.
FOOD MACHINERY & CHEMICAL CO., JOHN BEAN DIV.
 Food Machinery & Chemical Corp., Peerless Pump Div.
FRASER & CHALMERS ENG. WKS.
 Galigher Co., The
 Galigher Sump Pump—see Galigher Co., The
GARDNER-DENVER CO.
GENERAL ELECTRIC CO. LTD., THE
 Haselton—see Barrett, Haentjens & Co.
 Hitachi Ltd.
HYDROSEAL—SEE THE ALLEN-SHERMAN-HOFF PUMP CO.
 International Combustion Ltd.
 Jaeger Machine Co., The
 Johnston Pump Co.
 Kansas City Hay Press Co.
KLOCKNER-HUMBOLDT-DEUTZ, A. G.
 Knapp & Bates Ltd.
 Lightning Pumps—see Kansas City Hay Press Co.
LINATEX CORP. OF AMERICA
 Morris Machine Works
 Morse Bros. Machinery Co.
MOTORAMIC INC.
NAGLE PUMPS, INC.
O.D.S.—SEE DORR-OLIVER, INC.
 Peerless Pumps, Inc.
 Pegson Ltd.
 Pettibone-Mulliken Corp.
 Pleuger, Unterwasserpumpen
 Powermite Drill & Tool Co.
 Rice Pump & Machine Co.
 Robbins & Myers, Inc.
SPANG & CO.
 Stenberg Corp. of Canada Ltd.
 R. O. Stokes & Co., Ltd.
 Svenska Motorbör, A. B.
 Sweet Iron Works, A. L.
 Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
THOR POWER TOOL CO.
 Vacsall—see Galigher Co., The
 Vacsall—see International Combustion Ltd.
WEDA. SEE MOTORAMIC, INC. & SVENSKA MOTORBÖR
WEDAG (WESTFALIA DINNEN-DAHL GROPPLE AG)
WEMCO—SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.
WILFLEY & SONS INC., A. R.
 Wilkison Linatex Ltd. of Canada
 Worthington Corp.
 Yuba Manufacturing Div. Yuba Consolidated Industries, Inc.

VACUUM

ALLIS-CHALMERS MFG. CO. INDUSTRIES GROUP
 Barrett-Haentjens & Co.
 Braun-Knecht-Heilmann
 Central Scientific Co. of California
CHICAGO PNEUMATIC TOOL CO.
 Consolidated Pneumatic Tool Co., Ltd.
DORR-OLIVER INC.
 Galigher Co.
GARDNER-DENVER CO.
 Gutehoffnungshutte, A.G.
 Haselton—see Barrett-Haentjens & Co.
 Hitachi Ltd.
HUMBOLDT-KLOCKNER-DEUTZ, AG
INGERSOLL-RAND CO.
 International Combustion Co.
JOY MFG. CO.
 Mannesmann Export G.m.b.H.
 Mine Safety Appliances Co.
OLIVER—SEE DORR-OLIVER INC.
PETERSON FILTERS & ENG. CO.
 Rotts-Connorsville Blower
 Texas Gulf Sulphur Co.
 Thunes Mek. Verktad, A.S.
WEDAG (WESTFALIA DINNEN-DAHL GROPPLE AG)
 Worthington Corp.

SUBMERSIBLE

Byron Jackson Pumps, Inc.
FLYGT—see Stenberg Corp. Motoramic, Inc.

DIAPHRAGM

Chain Belt Co.
DENVER EQUIPMENT CO.
GARDNER-DENVER CO.
 Hitachi, Ltd.
 Jaeger Machine Co.
 Knapp & Bates Ltd.
 Le Grand Sutcliffe & Gell Ltd.
 Pegson Ltd.
 R. O. Stokes & Co. Ltd.

WEDAG WESTERN MACHINERY CO. PYROMETALLURGICAL EQUIPMENT

See also Laboratory Equipment and Supplies; Sintering Machines; Dryers and Kilns

CONVERTERS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 Dorr-Oliver G.m.b.H.
FRASER & CHALMERS ENG. WORKS
 General Electric Co., Apparatus Sales Div.
 Kennedy-Van Saun Mfg. & Eng. Corp.
KLOCKNER-HUMBOLDT-DEUTZ, AG
TREADWELL CO., INC., M. H.

ELECTRIC FURNACES

General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO. LTD.
LECTROMELT FURNACE DIV., MCGRAW-EDISON CO.
 U. S. Steel

CUPELLING FURNACES

MACE CO., THE
REVERBERATORY FURNACES

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
DENVER FIRE CLAY CO., THE
KLOCKNER-HUMBOLDT-DEUTZ, A. G.
MACE CO., THE
TREADWELL CO., INC., M. H.

ROASTING FURNACES

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 Bethlehem Steel
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO., THE
DORR-OLIVER, INC.
 Dorr-Oliver G.m.b.H.
DORR-OLIVER—SEE DORR-OLIVER, INC.
GOULD & CO., GORDON I.
HARDINGE CO., INC.
 Hartwig, Walter
 Huntington, Heberlein & Co., Ltd.
 Kennedy-Van Saun Mfg. & Eng. Corp.
KLOCKNER-HUMBOLDT-DEUTZ, A. G.
MACE CO., THE
MINE & SMELTER SUPPLY CO.
 Nichols Engineering & Research Corp.

Nichols Herreschoff—see Nichols Engineering & Research Corp.
 Pacific Foundry Co., Ltd.
 Parry—see Silver Eng. Co.
 Pollock Co., The William B.
 Silver Engineering Co.
SKINNER—SEE MINE & SMELTER SUPPLY CO.
STEARNS-ROGER MFG. CO.
 Surface Combustion Corp.
TRAYLOR ENGR. & MFG. CO.
TREADWELL CO., INC., M. H.
 Westinghouse Electric Corp.

SMELTING FURNACES

ALLIS-CHALMERS MFG. INDUSTRIES GROUP
 Bethlehem Steel
 Demag-Elektrometallurgie G.m.b.H.
 Elektrokemik A.S.
 Elken—see Elektrokemik A.S.
FRASER & CHALMERS ENG. WORKS

HEROULT ELECTRIC FURNACE—SEE U.S. STEEL EXPORT CO.

Huntington, Heberlein & Co., Ltd.
 Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT-DEUTZ, A. G.

LECTROMELT FURNACE DIV.

MACE CO., THE

MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.

Pollock Co., The William B.
 Soderbert Electrodes—see Elektro-

TRAYLOR ENGR. & MFG. CO.
TREADWELL CO., INC., M. H.
 Tyland-Hole—see Elektrokemik A.S.

UNITED STATES STEEL EXPORT CO.
 Westinghouse Electric Co.

RADIO SYSTEMS

See Communications

RAIL, MINE

See Track and Accessories

RAISE DRIVING PLATFORMS

ALIMAK CORP.
ALIMAK VERKEN A/B
 Hirsch Bros. Machine Co., Inc.

REAGENTS AND CHEMICALS

See also Laboratory Equipment and Supplies

CHEMICALS AND SERVICE

Halliburton Oil Well Cementing Co.
 Matheson Soliman & Bell, Div., The
 Matheson Co., Inc.

CHELATING

AMERICAN CYANAMID CO., EXPLOSIVES & MINING CHEMICALS DEPT.
 Crown Zellerbach Corp.
DOW CHEMICAL INTERNATIONAL LTD., S.A.

CYANIDE

Allied Chemical Corp., General Chemical Div.
AMERICAN CYANAMID COMPANY MINERAL DRESSING DEPT.

Braun-Knecht-Heilmann Co.
 du Pont de Nemours & Co., E. I.
 Electrochemicals Dept.
 Van Waters & Rogers, Inc.
 Walker Machinery Co.

FERROSILICON

HOSTACHEM CORP. (U.S. DISTRIBUTOR FOR KNAPSACK-GRIESHEIM A.G.)
KNAPSACK-GRIESHEIM A.G.

FLOCCULENTS

Allied Chemical Corp., General Chemical Div.
AMERICAN CYANAMID CO., EXPLOSIVES & MINING CHEMICALS DEPT.
 Cesalpinia s.p.a.
 Crown Zellerbach Corp.
DOW CHEMICAL INTERNATIONAL LTD., S.A.
 General Mills, Inc., Special Commodities Div.
 Hercules Powder Co.
 Philadelphia Quarts Co.
 Stauffer Chemical Co.
 Walker Machinery Co.
WEDAG

FLOTATION REAGENTS

Alamacs, Alamines—see General Mills Inc., Chem Div.
 Allied Chem. Corp., Barrett Div.
AMERICAN CYANAMID COMPANY MINERAL DRESSING DEPT.

Armour Chemical Division
ATLAS POWDER CO.
 Braun Chemical Co.
 Braun-Knecht-Heilmann Co.
 Crown Zellerbach Corp.
 Dow Chemical Co., The
DOW CHEMICAL INTERNATIONAL LTD., S.A.

du Pont de Nemours & Co., Inc., Chemical Div.

Emery Industries, Inc.
FARBERKE HOECHST A.G.
 General Mills, Inc., Chemical Div.
 General Mills, Inc., Special Commodities Div.

Hercules Powder Co.
 Koppers Co., Inc.
 Monsanto Chem. Co.
 Newport Industries Co.
 Pacific Lumber Co., The
PENNSALT CHEMICALS CORP.
 Philadelphia Quarts Co.

Reilly Tar & Chemical Corp.
 Rohm & Haas Co.
 Sharples Chemicals Inc.
 Sonneborn Sons, Inc., L.
 Standard Oil Co. of Calif.
 Stauffer Chemical Co.
 United States Steel Corp.

Van Waters & Rogers Inc.
 Walker Machinery Co.
WEDAG (WESTFALIA DINNEN-DAHL GROPPLE AG)
 West Virginia Pulp & Paper Co.

GROUTS

AMERICAN CYANAMID CO., EXPLOSIVES & MINING CHEMICALS DEPT.

Ion Exchange Resins

DOW CHEMICAL INTERNATIONAL LTD., S.A.

Inflico, Inc.
Permutit Co., The
**PETERSON FILTER & ENGI-
NEERING CO.**
Rohm & Haas Co.

PRESERVATIVES, TIMBER AMERICAN POTASH & CHEMI- CAL CORP.

American Cyanamid Co.
Carbolineum Wood Preserving Co.
Dow Chemical Co., The
**DOW CHEMICAL INTERNATION-
AL LTD. S.A.**
du Pont de Nemours & Co. Inc.,
Chemical Div.
General Petroleum Corp.
Koppers Co., Inc., Wood Preserving
Div.

Lerlab Supply Co.
Monsanto Chemical Co.
Osmoplastic & Osmosalts—see Os-
mose Wood Preserving Co. of
America, Inc.
Osmose Wood Preserving Co. of
America, Inc.
**PENNSALT OF WASHINGTON
DIV., PENNSALT CHEMI-
CALS CORP.**

Philadelphia Quartz Co.
Reddy Tar & Chemical Corp.
Standard Oil Co. of Calif.
U. S. Steel Corp.
Van Waters & Rogers, Inc.
Wolman—see Koppers Co., Inc.,
Wood Preserving Div.

ROADBINDERS

Orsan AL-50, Crown Zellerbach
Corp.

SEQUESTERING

**AMERICAN CYANAMID CO., EX-
PLOSIVES & MINING CHEM-
ICALS DEPT.**
Orsan A. Crown Zellerbach Corp.
Halliburton Oil Well Cementing Co.

XANTHATES

**AMERICAN CYANAMID CO., EX-
PLOSIVES & MINING CHEM-
ICALS DEPT.**
**DOW CHEMICAL INTERNATION-
AL LTD. S.A.**
Walker Machinery Co.

RECORDERS

ELECTRICAL

ABC Scale Div., The McDowell Co.
Abern Company
Barber-Colman Co., Wheelco In-
struments Div.
Bristol Co., The
Daystrom, Inc., Daystrom-Weston
Sales Div.
Electronix—see Minneapolis-Honey-
well Regulator Co.
Esterline-Angus Co., Inc., The
Fischer & Porter Co.
Foxboro Co., The
General Electric Co., Apparatus
Sales Div.
GENERAL ELECTRIC CO. LTD.
Industrial Nucleonics Corp.
**INDUSTRIAL PHYSICS & ELEC-
TRONICS CO.**
Inflico, Inc.
Leeds & Northrup Co.
LOGAN ENGR. CO.
Mine Safety Appliances Co.
Minneapolis-Honeywell-Helland
Div.
Minneapolis-Honeywell Regulator
Co.
Nucleonic Corp. of America
Texas Instruments, Inc.
Toledo Scale Co.
Westinghouse Electric Corp.
Weston Instruments (Div. of Day-
strom, Inc.)
Wheelco Instruments Div., Barber-
Colman Co.

MECHANICAL

ABC Scale Div., The McDowell Co.
Bristol Co., The
Daystrom-Weston Sales Div., Day-
strom Inc.
Douglas & Gierans
Foxboro Co., The
**INDUSTRIAL PHYSICS & ELEC-
TRONICS CO.**
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator
Co.
Nucleonic Corp. of America
Penn Instrument Corp.
Permutit Co., The
Toledo Scale Co.

PNEUMATIC

ABC Scale Div., The McDowell Co.
Bristol Co., The
Daystrom-Weston Sales Div., Day-
strom, Inc.
English Drilling Equip. Co.

Fischer & Porter Co.
Foxboro Co., The
**INDUSTRIAL PHYSICS & ELEC-
TRONICS CO.**
Inflico, Inc.
Minneapolis-Honeywell Regulator
Co.

REDUCERS, SPEED

ALLIS-CHALMERS MFG. CO.
Brown Corp. (Sales) Ltd., David
Dodge Mfg. Corp.
Falk Corp.
General Dynamics Corp., Electro
Dynamic Div.
HEWITT-ROBINS, INC.
**HUMBOLDT-KLOCKNER DEUTZ
AG.**
Iowa Mfg. Co.
Morse Chain Co.
NATIONAL IRON CO.
Sheepbridge Equipment Ltd.
Stephens-Adams Mfg. Co.
Sterling Electric Motors Inc.
Western Gear Corp., (Calif.)
Westinghouse Electric Corp.

REFRACTORIES

Air Placement Equip. Co.
AMERICAN BRAKE SHOE CO.
BABCOCK & WILCOX CO., THE
Carborundum Co., The, Refractories
Div.
**DFC—SEE DENVER FIRE CLAY
CO., THE**
DENVER FIRE CLAY CO., THE
General Refractories Co.
Harbison-Walker Refractories Co.
Johns-Manville Sales Corp.
Kaiser Aluminum & Chem. Corp.
Mexico Refractories Co.
North American Refractories Co.
Norton Co.
SPANG & CO.
John G. Stein & Co. Ltd.

RESPIRATORS

See Safety Equipment

ROASTING

FURNACES

See Dryers and Kilns; Pyro-
metallurgical Equipment; Sinter-
ing Machines

ROCK BOLTS

See Bolts, Rock

ROD MILLS

See Grinding Equipment

RODS

See Grinding Equipment;
Welding Equipment

ROOF BOLTS

See Bolts, Rock

ROPE, WIRE

ACCESSORIES

American Chain & Cable Company,
Inc.
American Chain & Cable Co., Inc.,
Hazard Wire Rope Div.
American Hoist & Derrick Co.,
Crosby-Laughlin Div.
Band-it Co.
Bethlehem Steel
British Rope Ltd.
**BRITISH ROPEWAY ENGINEER-
ING CO. LTD.**
Broderick & Bascom Rope Co.
BULLARD CO., E. D.
**BULLARD-BURNHAM—SEE
BULLARD CO., E. D.**
Canada Wire & Cable Co., Ltd.
"C"
Canton Mfg. Co.
Chase Brass & Copper Co.
COLEMAN CABLE & WIRE CO.
**COLORADO FUEL & IRON
CORP.**
**COLUMBIA STEEL CASTING CO.,
INC.**

Craelius Company, Ltd.
Crucible Steel Co. of America
E. H. Edwards Co.
Electric Steel Foundry Co.
Falling Co., Geo. F.
GRAYBAR ELECTRIC CO., INC.
GOODRICH CO., THE B. F.
Gripshoit, Inc.
Jones & Laughlin Steel Corp.
JOY MFG. CO.
Laughlin Co., The Thomas
**LE TOURNEAU-WESTINGHOUSE
CO.**
Leschen Wire Rope—see H. K. Por-
ter Co., Inc.
MacWhyte Co.
Mill & Mine Supply, Inc.
Mitchell Ropeways Ltd.
NATIONAL MINE SERVICE CO.
Okonite Co., The
Pacific Car & Foundry Co.
Pacific Wire Rope Co.
H. K. Porter Co., Inc., Leschen
Wire Rope Div.
Princeton Gripshoit Inc.
RIBLET TRAMWAY CO.
Roder-Blackburn Intl. Corp.
ROEBLING'S SONS CORP., JOHN
Round Chain Co.
Ryerson & Son, Inc., Joseph T.
Rylands Brothers Limited
SAUERMAN BROS., INC.
Svenska Motorbör A.G.
TELLURIDE IRON WKS.
**TIGER BRAND—SEE U. S. STEEL
EXP. CO.**
**TOURNEAU—SEE LE TOUR-
NEAU-WESTINGHOUSE CO.**
Uddeholms Aktiebolag
Union Wire Rope Corp.
U. S. Steel Corp.
U.S.S.—Tiger Brand—See United
States Steel Corp.
**UNITED STATES STEEL EX-
P. CO.**
Wall Rope Wks., Inc.
Whitcomb Co., Ltd., The
Wire Rope Corp., of America, Inc.
**WICKWIRE—SEE COLORADO
FUEL & IRON CORP., THE**

RUBBER PRODUCTS

See Belts; Hose; Conveyor
Equipment; Safety Equipment

SAFETY EQUIPMENT

APPAREL

A & A Mfg. Co., Inc.
American Optical Co., Safety Prod-
ucts Div.
Bausch & Lomb Optical Co.
BULLARD CO., E. D.
CEAG
Gardwell—see Safety Clothing &
Equipment Co.
GOODALL RUBBER CO.
**GOODRICH, B. F., INDUSTRIAL
PRODUCTS CO.**
Industrial Air Prods. Co.
**INTERNATIONAL B. F. GOOD-
RICH**
Johns-Manville Sales Corp.
Lehigh Safety Shoe Co.
Martindale Electric Co.
Mine Safety Appliances Co.
Parker Safety Equipment Co.
H. K. Porter Co., Inc.
Pulmoan Safety Equip. Corp.
Ray-O-Vac Co., Div. of Electric
Storage Battery Co.
Safety First Supply Co.
Safety Products Ltd.
Skullgard—see Mine Safety Appli-
ances Co.
Sly Mfg. Co., W. W.
Thermoid Rubber Co.
United States Rubber Co.

FIRE-FIGHTING EQUIPMENT

American LaFrance, Div. of Ster-
ling Precision Corp.
American Rubber Mfg. Co.
Blackhawk Mfg. Co.
BULLARD CO., E. D.
CEAG
Conflow, Ltd.
Four Wheel Drive Auto Co., The
General Fire Extinguisher Corp.,
The
GOODRICH CO., THE B. F.
Grinnell Co., Inc.
Industrial Air Prods. Co.
**INTERNATIONAL B. F. GOOD-
RICH**
Johns-Manville
Kidd & Co. Inc., Walter
Lee Rubber & Tire Corp., Republic
Rubber Div.
Mine Safety Appliances Co.
H. K. Porter Co., Inc.
Pulmoan Safety Equipment Corp.
Republic Rubber Div., Lee Rubber
& Tire Corp.

Safety Fire Extinguisher Co.
Safety First Supply Co.
Thermoid Rubber Co.
U. S. Rubber Co.

LIGHTS

A & A Mfg. Co.
CEAG
John Davis & Son, Ltd.
Edison—see Mine Safety Appliances
Co.
**ELECTRIC STORAGE BATTERY
CO., THE EXIDE IND. DIV.**
General Electric Co., Lamp Div.
GRAYBAR ELECTRIC CO., INC.
Homelite Corp.
Justrite Mfg. Co.
Martindale Electric Co.
Mine Safety Appliances Co.
NATIONAL MINE SERVICE CO.
Oldham & Son, Ltd.
Ray-O-Vac Co.
Revere Electric Mfg. Co.
Safety First Supply Co.
United States Electric Mfg. Corp.
Westinghouse Electric Corp.
Westinghouse Electric Corp., Cleve-
land Div.
**WHEAT—SEE NATIONAL MINE
SERVICE CO.**

RESPIRATORS

American Optical Co., Safety Prod-
ucts Div.
BULLARD CO., E. D.
Chicago Eye Shield Co.
Linde Co.
Martindale Electric Co.
Mine Safety Appliances Co.
NATIONAL MINE SERVICE CO.
Pulmoan Safety Equip. Corp.
Ray-O-Vac Co.
Safety First Supply Co.
Safety Products Ltd.
Super-Tough—see Wilson Prod.,
Inc.
Willson Prod. Div., Ray-O-Vac Co.

SELF CONTAINED OXYGEN

BULLARD CO., E. D.
Chemox—see Mine Safety Appli-
ances Co.
Industrial Air Products Co.
Linde Co.
Mine Safety Appliances Co.
Safety First Supply Co.

SAMPLERS

DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO.
**DICKINSON LABORATORIES,
INC.**
Ducon Co.
**FRASER & CHALMERS ENG.
WORKS**
Gallagher Co., The
Gallagher Junior—see Gallagher Co.,
The
Gary-Jennings—see Gallagher Co.,
The
HANKS, INC., ABBOTT A.
HARDINGE CO., INC.
Heyl & Patterson, Inc.
Hirsch Bros. Machine Co., Inc.
HOLMAN BROS. LTD.
Inflico, Inc.
International Combustion Ltd.
**JONES—SEE DENVER FIRE
CLAY CO., THE**
JOY MANUFACTURING CO.
**KLOCKNER-HUMBOLDT-DEUTZ,
A. G.**
Knapp & Bates Ltd.
Ledoux & Co.
LONGYEAR CO., E. J.
McNally, Pittsburgh Co.
Mine & Smelter Supply Co.
Mine Safety Appliances Co.
Minerals et Metux
Mobile Drilling Inc.
STURTEVANT MILL CO.
TELLURIDE IRON WORKS CO.
TRAYLOR ENGR. & MFG. CO.
**VEZIN—SEE MINE & SMELTER
SUPPLY CO.**
**WEDAG (WESTFALIA DINNEN-
DAHL GROPPPEL AG)**

SAWS, POWER

See also Tools, Air Driven

CHAIN SAWS

Andreas Stihl Maschinenfabrik
Consolidated Pneumatic Tool Co.,
Ltd.
Dolmar Maschinen Fabrik
GRAYBAR ELECTRIC CO., INC.
Homelite Div., Textron, Inc.
Mill & Mine Supply, Inc.

Scales

Remington Arms Co., Inc.
Vulcan Iron Works (Denver)
Wright Power Saw and Tool Corp.

FRAMING SAWS

DENVER EQUIPMENT CO.
STEARNS ROGER MFG. CO.

POWERED HAND SAWS

Andreas Stihl Maschinenfabrik
ATLAS COPCO AB, SWEDEN
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co. Ltd.
GRAYBAR ELECTRIC CO., INC.
HOLMAN BROS. LTD.
INGERSOLL-RAND CO.
Syntrol Co.
THOR POWER TOOL CO.
Vulcan-Denver-Vulcan Iron Works
Wright Power Saw & Tool Corp.

SCALES

AUTOMATIC BELT SCALES

ABCs Scale Division, McDowell Co., Inc.
BALDWIN-LIMA-HAMILTON CORP.
CON-O-WEIGH, SEE INDUSTRIAL PHYSICS & ELECTRONICS CO.
Conveyor Co., The
Fairbanks, Morse & Co.
Howe Scale Co., The
INDUSTRIAL PHYSICS & ELECTRONICS CO.
Koebring Co., Johnson Co., C. S.
McDowell Co., Inc., The
Merrick Scale Mfg. Co.
MINE & SMELTER SUPPLY CO.
Poidometer—see Schaffer Poidometer Co.
Richardson Scale Co.
Schaffer Poidometer Co.
St. Regis Paper Co.
Toledo Scale Co.
Transpormeter—see McDowell Co., Inc., The
Weightometer—see Merrick Scale Mfg. Co.

TRUCK AND RAILROAD SCALES
Fairbanks, Morse & Co.
Howe Scale Co., The
INDUSTRIAL PHYSICS & ELECTRONICS CO.
Richardson Scale Co.
Toledo Scale Co.

SCALING PLATFORMS
ALIMAK CORP.
ALIMAK VERKEN A/B

SCRAPERS
See also Excavators; Tractors and Attachments

ALLIS-CHALMERS MFG. CO.
CONST. MACHY. DIV.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ALLOY STEEL & METALS CO.
AMERICAN MANGANESE STEEL DIV., AMERICAN BRAKE SHOE CO.
American Tractor Equipment Corp.
Austin Hopkinson & Co. Ltd.
BALDWIN-LIMA-HAMILTON CORP.

BRITISH ROPEWAY ENG. CORP.
Brown Corp. (Sales) Ltd., David CW—SEE CURTISS-WRIGHT CORP., SOUTH BEND DIV.

Caterpillar Tractor Co.
CLARK EQUIPMENT CO., CONST. MACHY. DIV.
COLUMBIA STEEL CASTING CO., INC.

CRESCENT — SEE SAUERMAN BROS., INC.
CURTISS-WRIGHT CORP., SOUTH BEND DIV.

Demag Aktiengesellschaft
EIMCO CORP., THE
Electric Steel Foundry Co.
GENERAL MOTORS CORP. EUCLID DIV.

GENERAL MOTORS OVERSEAS OPERATIONS
HEWITT-ROBINS, INC.
HOLMAN BROS. LTD.

International Combustion Ltd.
INTERNATIONAL HARVESTER CO.

JOY MANUFACTURING CO.
Joy-Sullivan Ltd.
Landis Steel Co.

LE TOURNEAU-WESTINGHOUSE CO.
MICHIGAN—SEE CLARK EQUIPMENT CO.

M-R-S Manufacturing Co.
PACIFIC—SEE ALLOY STEEL & METALS CO.

SALZGITTER MASCHINEN AKTIENGESellschaft
Pacific Car & Foundry Co.

SAUERMAN BROS., INC.
Terra Clipper—see Wooldridge Mfg. Co.

August Thiele G.m.b.H.
Vickers-Armstrongs (Engineers) Ltd.

VICKERS-ARMSTRONGS (TRACTORS) LTD.
Vulcan Denver—see Vulcan Iron Works, Denver, Colo.

Vulcan Iron Works (Denver)
Westinghouse Air Brake Co. (Pa.)

SCREENS, GRIZZLIES, AND ACCESSORIES

REVOLVING SCREENS
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.

Aveling-Barford, Ltd.
Bonded Scale & Machine Co.
Cleveland Wire Cloth & Mfg. Co.

Davison & Co., (Hexham) Ltd.
DENVER EQUIPMENT CO.
Diamond Iron Works, Div. Goodman Mfg. Co.

Dunham Mfg. & Sales Co., Gordon S.
FRASER & CHALMERS ENG. WORK

HACK ENG. CO.
Hendrick, Mfg. Co.
Hirsch Bros. Machine Co., Inc.

Iowa Mfg. Co.
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT-DEUTZ, A. G.
KRUPP, FRIED. MASCHINEN UND STAHLBAU RHEINHAUSEN

Link-Belt Co.
Lippmann Engineering Wks., Inc.
McLANAHAN & STONE CORP.

NORDBERG MFG. CO.
Pegson Ltd.
Pioneer Eng. Div., Poor & Co., Inc.

Rogers Iron Work Co.
Smith Engineering Works
SOUTHWESTERN ENGINEERING CO.

STEARNS-ROGER MFG. CO.
Stephens-Adamsen Mfg. Co.
SYMONS—SEE NORDBERG MFG. CO.

TELLURIDE IRON WORKS CO.
TYLER CO., W. S. THE
Universal Dredge Mfg. Co.

Washington Iron Works
Washington Machinery Co.
Wedge Wire Corp.

Yuba Consolidated Industries, Inc.

SHAKING AND VIBRATING SCREENS
AERO-VIBE—SEE ALLIS-CHALMERS MFG. CO.

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.

Aveling-Barford, Ltd.
Baker Perkins Ltd.
BALDWIN-LIMA-HAMILTON CORP.

Barber-Greene Co.
Bonded Scale & Machine Co.
Braun-Knecht-Heimann Co.

Carpeo Mfg. Inc.
Carrier Conveyor Corp.
Cleveland Wire Cloth & Mfg. Co., Inc., The

COLORADO FUEL & IRON CORP., THE
Davison & Co., (Hexham) Ltd.

DEISTER CONCENTRATOR CO.
Deister Machine Co.
DENVER EQUIP. CO.

Diamond Iron Works, Div. Goodman Mfg. Co.
Dravo Corp.

Dunham Mfg. & Sla. Co., Gordon S.
FRASER & CHALMERS ENG. WKS.

GENERAL ELECTRIC CO. LTD., THE
Gründler Crusher & Pulverizer Co.

Gyroscop—see Productive Equipment Corp.
HACK ENG. CO.

Hendrick Mfg. Co.
HEWITT-ROBINS, INC.
Hirsch Bros. Machine Co., Inc.

HUMBOLDT-KLOCKNER-HUMBOLDT-DEUTZ, A. G.
HUM-MER—SEE TYLER CO., THE W. S.

International Combustion Ltd.
Iowa Mfg. Co.

Jeffrey Manufacturing Co.
Kennedy-Van Saun Mfg. & Eng. Corp.

Korb Pettit-Wire Fabrics & Iron Wks., Inc.
KRUPP, FRIED. MASCHINEN UND STAHLBAU RHEINHAUSEN

LEAHY—SEE DEISTER CONCENTRATOR CO.
Link-Belt Co.

Lippmann Engineering Works
LOW-HEAD—SEE ALLIS-CHALMERS MFG. CO.

MADSEN, SEE BALDWIN-LIMA-HAMILTON CORP.
McLANAHAN & STONE CORP.

MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Miners Foundry & Mfg. Co.

Morgordshammars Mek. Verkstad A.B.
Moras Bros. Machinery Co.
NORDBERG MFG. CO.

RIPL, FLO—SEE ALLIS-CHALMERS MFG. CO.
Rogers Iron Works Inc.

Ross Screen & Feeder Co.
Simplicity Engineering Co.
Smith Engineering Works

SOUTHWESTERN ENGR. CO.
STA. PLO—SEE ALLIS-CHALMERS MFG. CO.

Star Wire Screen & Iron Works, Inc.
STEARNS-ROGER MFG. CO.

Stephens-Adamsen Mfg. Co.
Sturtevant Eng. Co. Ltd.
STURTEVANT MILL CO.

SYMONS—SEE NORDBERG MFG. CO.
Symons Bros. Co.

Syntrol Co.
Taylor-Wharton Iron & Steel Co.
THERMO-DECK—SEE ALLIS-CHALMERS MFG. CO.

TY-ROCK—SEE TYLER CO., THE W. S.
TY-ROCKET—SEE TYLER CO., THE W. S.

TYLER CO., THE W. S.
TYLER-NIAGARA—SEE TYLER CO., THE W. S.

Universal Dredge Mfg. Co.
Universal Engineering Corp.
Universal Vibrating Screen Co.

WEDAG
Wedge Wire Corp.
Williams Crusher & Pulverizer Co.

Wilmot Engineering Co.
Wolf, Buckau R. (Maschinenfabrik) A. G.

Yuba Consolidated Indus. Mining Div.

STATIONARY SCREENS AND GRIZZLIES
Allison Steel Mfg. Co.

AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.

AMSCO—SEE AMERICAN BRAKE SHOE CO.
Baker Perkins Ltd.

Bixby-Zimmer Engineering Co.
Bonded Scale & Machine Co.
CAL-WIC—SEE COLORADO FUEL & IRON CORP., THE

CARD IRON WKS. CO.
Cleveland Wire Cloth & Mfg. Co.
COLORADO FUEL & IRON CORP., THE

COLUMBIA STEEL CASTING CO., INC.
Davison & Co., (Hexham) Ltd.

Diamond Iron Works, Div. Goodman Mfg. Co.
DORR-OLIVER, INC.

FRASER & CHALMERS ENG. WKS.
Gründler Crusher & Pulverizer Co.

HACK ENG. CO.
Hadfield Ltd.

Hendrick Mfg. Co.
HEWITT-ROBINS, INC.
HOLMAN BROS. LTD.

(ENGLAND)
International Combustion Ltd.
Iowa Mfg. Co.

Jeffrey Mfg. Co., The
Kennedy-Van Saun Mfg. & Eng. Corp.

KLOCKNER-HUMBOLDT DEUTZ, A. G.
KRUPP, FRIED. MASCHINEN UND STAHLBAU RHEINHAUSEN

Link-Belt Co.
Lippmann Engineering Works
MALLIX—SEE NATIONAL MALLEABLE & STEEL CASTINGS CO.

McLANAHAN & STONE CORP.
NATIONAL IRON CO.
NATIONAL MALLEABLE & STEEL CASTINGS CO.

Nolan Co., The
Pioneer Eng. Div., Poor & Co., Inc.

Rogers Iron Works Inc.
Ross Screen & Feeder Co.
Sheepbridge Engr. Ltd.

Sheepbridge Equip. Ltd.
Simplicity Eng. Co.
Smith Engineering Works

SOUTHWESTERN ENGINEERING CO.
Star Wire Screen & Iron Works, Inc.

STEARNS-ROGER MFG. CO.
Stephens-Adamsen Mfg. Co.

Star Wire Screen & Iron Wks., Inc.
Syntrol Co.
Taylor-Wharton Iron & Steel Co.

TELLURIDE IRON WKS.
TRAYLOR ENGINEERING & MFG. CO.

TYLER CO., THE W. S.
Universal Dredge Mfg. Co.
Universal Engineering Corp.

Washington Machinery Co.
Wedge Wire Corp.
Yuba Consolidated Indus. Mining Co.

TROMMELS
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.

AMSCO—SEE AMERICAN BRAKE SHOE CO.
CAL-WIC—SEE COLORADO FUEL & IRON CORP., THE

CARD IRON WKS. CO.
Cleveland Wire Cloth & Mfg. Co.
COLORADO FUEL & IRON CORP., THE

COLUMBIA STEEL CASTING CO., INC.
Gründler Crusher & Pulverizer Co.

Gundlach Machine Co., T. J.
Hendrick Mfg. Co.
Iowa Mfg. Co.

Kennedy-Van Saun Mfg. & Eng. Corp.
Link-Belt Co.

Lippmann Engineering Works
Macklin Equip. Co.

McLANAHAN & STONE CORP.
Miners Foundry & Mfg. Co.
NORDBERG MFG. CO.

Pioneer Engineering Div., Poor & Co., Inc.

Rogers Iron Works Co.
Smith Engineering Works
STEARNS ROGER MFG. CO.

Stephens-Adamsen Mfg. Co.
SYMONS—SEE NORDBERG MFG. CO.

Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.

TRAYLOR ENGR. & MFG. CO.
Universal Engineering Corp.
Washington Iron Wks.

Wedge Wire Corp.
Yuba Manufacturing Co.

VERTICAL SCREENS
Link-Belt Co.

NORDBERG MFG. CO.
SYMONS—SEE NORDBERG MFG. CO.

VIBRATING GRIZZLIES
HOLMAN BROS. LTD.

Link-Belt Co.
NORDBERG MFG. CO.

SYMONS—SEE NORDBERG MFG. CO.

WIRE AND BAR SCREENS
ALLIS-CHALMERS MFG. CO.

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.

AMSCO—SEE AMERICAN BRAKE SHOE CO.

Barber-Greene Co.
Bixby-Zimmer Engineering Co.

Bonded Scale & Machine Co.
CAL-WIC—SEE COLORADO FUEL & IRON CORP., THE

Chain Belt Co.
Chase Brass & Copper Co.
Cleveland Wire Cloth & Mfg. Co.

COLORADO FUEL & IRON CORP., THE
Diamond Iron Works, Div. Goodman Mfg. Co.

FRASER & CHALMERS ENG. WKS.
HACK ENGINEERING CO.

Haver & Boecker
Hein Lehmann & Co.
Hendrick Mfg. Co.

HEWITT-ROBINS, INC.
HEWITT-ROBINS INC. KORB-PETTIT WIRE FABRICS & IRON WORKS, INC., A SUBSID.

International Combustion Products Ltd.

Iowa Mfg. Co.
KLOCKNER-HUMBOLDT DEUTZ, A. G.
Korb Pettit Wire Fabrics & Iron Wks., Inc.
Link-Belt Co.
Lippmann Engineering Works
Ludlow-Saylor Wire Cloth Co.
MALLIX-SEE NATIONAL MALLEABLE & STEEL CASTINGS CO.

NATIONAL MALLEABLE & STEEL CASTINGS CO.
NORDBERG MFG. CO.
Overstrom & Sons
Pioneer Eng. Div., Poor & Co., Inc.
Productive Equip. Corp.
Ross Screen & Feeder Co.
Sheepbridge Equip. Ltd.
Simplicity Engineering Co.
Smith Engineering Works
SOUTHWESTERN ENGINEERING CO.

STEARN-ROGER MFG. CO.
Super Gyraloy-Korb Pettit Wire Fabrics & Iron Works, Inc.
Super-LOY-see Ludlow-Saylor Wire Cloth Co.
SYMONS-SEE NORDBERG MFG. CO.
Taylor-Wharton Iron & Steel Co.
TY-LOC-SEE TYLER CO., THE W. S.
TYLER CO., THE W. S.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
U. S. Steel
Wedge Slot-see Hendrick Mfg. Co.
Wedge Wire Corp.
Westfälische Maschinenbau G.m.b.H.
Yuba Consolidated Indus., Mining Div.

SCRUBBERS

See also Agitators and Conditioners; Engine Exhaust Conditioners

GAS
Dorr-Oliver G.m.b.H.
EIMCO CORP., THE
FLUOR PRODUCTS CO.
Hunslet Engine Co. Ltd., The
INTERNATIONAL HARVESTER CO.

Johnson-March Corp.
KLOCKNER-HUMBOLDT DEUTZ, A. G.
NATIONAL MINE SERVICE CO.
National Tank & Pipe Co.
OCM Catalytic Exhaust, Oxy Muffler Exhaust, Oxyat-see Oxy-Catalyst, Inc.

Ocm Diesel Exhaust-see Oxy-Catalyst, Inc.
Oxy-Catalyst, Inc.
PETERSON FILTERS & ENGR. CO.

Ruth Co., The
SANTA FE TANK DIV., FLUOR PRODUCTS CO.
STANDARD STEEL CORP.
STEARN-ROGER MFG. CO., THE
Sturtevant Eng. Co. Ltd.
TELLURIDE IRON WORKS CO.
WESTERN PRECIPITATION CORP.

Winslow Eng. & Mfg. Co.
MINERALS WASHER
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP

Booth Co., Inc., The
GENERAL ELECTRIC CO. LTD.
Gründler Crusher & Pulverizer Co.
HACK ENGINEERING CO.
HARDINGE CO., INC.
HUMBOLDT, KLOCKNER-HUMBOLDT-DEUTZ AG

Iowa Mfg. Co.
Kennedy-Van Saun Mfg. & Eng. Corp.

Knapp & Bates Ltd.
Link-Belt Co.
Lippmann Engineering Works
MARCY-SEE MINE & SMELTER SUPPLY CO., THE
McLANAHAN & STONE CO.
MINE & SMELTER SUPPLY CO., THE

Pegson Ltd.
Pioneer Engineering, Div. Poor & Co., Inc.

Rogers Iron Works Co.
Smith Engineering Works
TELLURIDE IRON WKS.

Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.

WEMCO-SEE WESTERN MACHINERY CO.

WESTERN MACHINERY CO.

SELF-LOADING

TRANSPORT,

UNDERGROUND

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
EIMCO CORP., THE
Gismo-see Sanford-Day Iron Works, Inc.

HEWITT-ROBINS, INC.
HUDSON, E., LTD.
Hunslet Engine Co.
Irwin Foundry & Mine Car Co.
Jeffrey Mfg. Co., The
Link-Belt Co.
MACHINERY CENTER INC.
Napco Industries, Inc.
Sanford Day Iron Wks.
Westinghouse Air Brake Co., (Pa.)
Westinghouse Air Brake Co., Le Roi Div.

SEPARATORS

See also Magnetic Equipment; Classifiers; Concentrators

AIR
American Air Filter Co., Inc.
Combustion Engineering, Inc., Raymond Div.
EIMCO CORP., THE
HARDINGE CO., INC.
INGERSOLL-RAND
I-T-E Circuit Breaker Co.
International Combustion, Ltd.
Kennedy-Van Saun Mfg. & Eng. Corp.
KLOCKNER-HUMBOLDT-DEUTZ, A. G.

Knapp & Bates Ltd.
LOGAN ENGINEERING CO.
New Jersey Meter Co.
Scott's Concentrators
Sly, Mfg. Co. W. W. The
Sturtevant Eng. Co. Ltd.
STURTEVANT MILL CO.
Universal Road Machinery Co.
Williams Crusher & Pulverizer Co.

ELECTROSTATIC
American Air Filter Co., Inc.
Carpeo Mfg. Inc.
Dings Magnetic Separator
FRASER & CHALMERS ENG. WORKS

Johnson, Consultant, Herbert B.
JOY MANUFACTURING CO.
Rapid Magnetic Machines, Ltd.
Scott's Concentrators
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

HIGH TENSION
Carpeo Mfg. Inc.
Dings Magnetic Separator Co.
JOY MFG. CO.

Johnson, Herbert B.
Magnetic Engr. & Mfg. Co.
Rapid Magnetic Ltd.
Scott's Concentrators
Stearns Magnetic Products
Sturtevant Eng. Co. Ltd.

SETS, STEEL

See Steel

SHAFT COUPLINGS

See Couplings

SHAFT-MOUNTED

DRIVES

See also Drives; Gears; Open Gearing

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP

Brown Corp. (Sales) Ltd., David
BROWN INC., DAVID
Dodge Mfg. Corp.
Falk Corp.

General Electric Co., Apparatus Sales Div.

HEWITT-ROBINS INC.
Link-Belt Co.

NATIONAL IRON CO.
Renold Chains Ltd.

Sterling Electric Motors, Inc.
U. S. Electric Motors Inc.

Westinghouse Electric Corp.

SHAFT SINKING

CONTRACTORS

BOYLES BROS. DRILLING CO.
Cementation Co. Ltd., The
Corwin & Co., Inc.
Dravo Corp.
LONGYEAR CO., E. J.
McKenzie & Whittle Cont.

EQUIPMENT

ATLAS COPCO, INC.
ATLAS COPCO AG, SWEDEN
Barker, Davies & Co.
Barrett, Haentjens & Co.
BOYLES BROS. DRILLING CO.
Cementation Co. Ltd., The
Coeur d'Alene Hardware & Foundry Co.

Consolidated Pneumatic Tool Co. Ltd.

Cryderman-See Shaft & Development Mach. Co.

Demag Aktiengesellschaft
EIMCO CORP., THE
EISENHUTTE PRINZ RUDOLPH, A.G.

Hirsch Bros. Machine Co., Inc.
INGERSOLL-RAND CO., LTD.
JOY MFG. CO.

Kaiser Engineers
Machinery Center Co., Ltd.
Mayo Tunnel & Mines Equip.

Miners Foundry & Mfg. Co.
Ogden Iron Works Co.

Pinassee-See Vulcan Iron Wks., (Colo.)

Priestman Bros. Ltd.
Shaft & Development Mach.

TELLURIDE IRON WORKS CO.
Vulcan Iron Works Co.

Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.

Wood & Sons Ltd., John
FORMATION CONSOLIDATION

BOYLES BROS. DRILLING CO.

CAGES

ALIMAK CORP.
Coeur d'Alene Hardware & Foundry Co.
Hirsch Bros. Machine Co., Inc.
Ogden Iron Works Co.
MACHINERY CENTER INC.
Vulcan Iron Works Co.

JUMBS

CHICAGO PNEUMATIC TOOL CO.
INGERSOLL-RAND CO., LTD.

JOY MFG. CO.
LeRoi Div., Westinghouse Air Brake Co.

MACHINERY CENTER INC.
Shaft & Development Machines Co.

MUCKERS

ALIMAK CORP.
ALIMAK VERKEN AB

Coeur d'Alene Hardware & Foundry Co.

EIMCO CORP.
JOY MFG. CO.

MACHINERY CENTER INC.
Shaft & Development Machines Co.

Vulcan Iron Works Co.

SKIPS & BUCKETS

Allen & Sons (Tipton) Ltd., W.G.

BOYLES BROS. DRILLING CO.
Coeur d'Alene Hardware & Foundry Co.

Hirsch Bros. Machine Co., Inc.
MACHINERY CENTER INC.

Ogden Iron Works Co.
Shaft & Development Machine Co.

Vulcan Iron Works Co.

STEEL FORMS

Hirsch Bros. Machine Co., Inc.
Mayo Tunnel & Mine Equipment

Ogden Iron Works Co.

SHAKERS, CAR

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP

Carneke-see Stephens-Adamson Mfg. Co.

Carrier Conveyor Corp.
Cleveland Vibrator Co.

HEWITT-ROBINS, INC.

Link-Belt Co.
R & M-see Robbins & Myers, Inc.
Robbins & Myers, Inc.
Sanford Day Iron Works, Inc.
Simplicity Engr. Co.
Stephens-Adamson Mfg. Co.
Syntron Co.

SHARPENERS, ROCK

BIT AND STEEL

Armour & Co., Coated Abrasives Div., Alliance, Ohio
ATLAS COPCO A. B. SWEDEN
ATLAS COPCO, INC.
Bohler Bros. & Co., Ltd.
Bohler, Gebr. & Co. A.G.
Climax Rock Drill & Engineering Works, Ltd.

Coeur d'Alene Hardware & Foundry Co.

Consolidated Pneumatic Tool Co., Ltd.

Dagenhardt-Utash K.G.
Demag Aktiengesellschaft
Dravo Corp.

FLOTTMAN-WERKE G.M.B.H.
GARDNER-DENVER CO.

Grindex-see Uddeholm Co. of America, Inc.

Halifax Tool Co. Ltd.
Hardywick Ltd.

HOLMAN BROS. LTD.
INGERSOLL-RAND CO.

JOY MFG. CO.
MASSCO-SEE MINE & SMELTER SUPPLY CO.

MINE & SMELTER SUPPLY CO.
SALZGITTER MASCHINEN A. G.

Security Engineering Div. Dresser Operations, Inc.

STANCO MFG. & SALES, INC.

THOR. POWER TOOL CO.

Uddeholm Co. of America, Inc.

SHEAVES

See Blocks and Sheaves

SHOVELS, POWER

See Excavators

SHUTTLE CARS

W. G. Allen & Sons (Tipton), Ltd.
Dart Co. (See K. W. Dart Truck Co.)

GETMAN BROS. MFG. CO.
Goodman Mfg. Co.

Irwin-Sensenich Corp.
Jeffrey Mfg. Co., The

JOY MFG. CO.
Joy-Sullivan Ltd.

LAKE SHORE INC.
MACHINERY CENTER INC.

NATIONAL MINE SERVICE CO.
Washington Iron Works

SINTERING

MACHINES

See also Pyrometallurgical Equipment; Dryers and Kilns, Pelletizers

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP

AMERICAN BRAKE SHOE CO.
AMERICAN MANGANESE STEEL DIV.

AMSCO-SEE AMERICAN BRAKE SHOE CO.

Baker Perkins Ltd.

Dravo Corp.

Dwight Lloyd-see McDowell Co., Ltd.

Electric Steel Foundry Co.
Gutehoffnungshütte, A.G.

Hevi-Duty Electric Co.
Heyl & Patterson, Inc.

Huntington, Heberlein & Co., Ltd.

HUMBOLDT, KLOCKNER-HUMBOLDT DEUTZ AG

Kennedy-Van Saun Mfg. & Eng. Corp.

MADE CO., THE

McDowell Co., Inc., The Dwight Lloyd Div.

NATIONAL MALLEABLE & STEEL CASTINGS CO.

Pollock Co., The William B.

SMITH & CO., F. L.

STANDARD STEEL CORP.

Yuba Manufacturing Co.

Manufacturers' Complete Names and Addresses are listed on the last pages of this yellow section. Advertisers in this issue are listed in boldface capital letters.

Spirals

See Pyrometallurgical Equipment

SPIRALS

See Concentrators

SPOTTERS, CAR

Aldon Company, The
Austin Hopkinson & Co. Ltd.
Badger Line—see Advance Car
Mover Co., Inc.
Brownie—see Sanford Day Iron
Wks.
Christian Engineers, J.D.
Clyde Iron Works, Inc.
Connellsville Mfg. & Mine Supply
Co.
Gregg Co., Ltd.
Hemshardt, Hermann
HEWITT-ROBINS, INC.
Hough Co., The Frank G.
Jeffrey Manufacturing Co., The
JOY MANUFACTURING CO.
Joy-Sullivan Ltd.
Link-Belt Co.
Nolan Co., The
Nolan Porta-Feeder—see Nolan Co.,
The
Sanford Day Iron Wks.
Shepard Niles Crane & Hoist Corp.
Stephens-Adamsen Mfg. Co.
RICHARD SUTCLIFFE, LTD.
Vulcan Iron Works Co., Colorado
Vulcan Iron Works (Pa.)

STACKERS

ORE or WASTE

HEWITT-ROBINS, INC.
Hitachi Ltd.
Jeffrey Mfg. Co.
Orenstein-Koppel Und Lubecker
Maschinenbau A.G.
Stephens-Adamsen Mfg. Co.

STEEL

See also Bits

ALLOY STEEL

AMERICAN MANGANESE STEEL
DIV. - AMERICAN BRAKE
SHOE CO.
Armco Drainage & Metal Prods.,
Inc.
ARMCO STEEL CORP.
ATLAS COPCO AB, SWEDEN
ATLAS COPCO, INC.
Bethlehem Steel Co.
Bohler Bros. & Co., Ltd.
Central Mine Equip. Co.
Crucible Steel Co. of America
Electric Steel Foundry Co.
English Steel Corp.
Fagersta Steels Pacific, Inc.
Firth Sterling, Inc.
GARDNER-DENVER CO.
NATIONAL MALLEABLE &
STEEL CASTINGS CORP.
Republie Steel Corp.
Ryerson & Son, Inc., Joseph T.
SANDVIK COROMAT—SEE AT-
LAS COPCO, A.B. SWEDEN
SHEFFIELD DIV., ARMCO STEEL
CORP.
Sterling—see Firth Sterling, Inc.
Stutz-Sickles Co.
Taylor-Wharton Iron & Steel Co.
Tennessee Coal & Iron Div., U.S.S.
Corp.
Timken Roller Bearing Co., The
Uddenholm Co. of America
UNITED STATES STEEL EXPORT
CO.
USS—See U.S. Steel Corp.
U. S. Steel Corp.
Columbia-Geneva Div.
Youngstown Sheet & Tube Co., The

DRILL STEEL

Allison Steel Mfg. Co.
AMERICAN BRAKE SHOE CO.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
ATLAS COPCO, INC.
ATLAS COPCO, A.B. SWEDEN
Bethlehem Steel
Bohler Bros. & Co., Ltd.
BRUNNER & LAY INC. LTD.
CHRISTENSEN DIAMOND PRO-
DUCTS
Consolidated Pneumatic Tool Co.,
Ltd.
Crucible Steel Co. of America
English Steel Corp.
Fagersta AB
Fagersta Steels Pacific, Inc.
Firth Sterling, Inc.

FLOTTMAN-WERKE G.M.B.H.
GARDNER-DENVER CO.
Hadfield Ltd.
Haitex Tool Co.
INGERSOLL-RAND CO.
Jones & Laughlin Steel Corp.
JOY MFG. CO.
E. J. LONGYEAR CO.
MCCLEINTOCK CO., R. S.
Mine Safety Appliances Co.
Mobile Drilling, Inc.
Pennsylvania Drilling Co.
Republic Steel Corp.
Ryerson & Son, Inc., Joseph T.
Schramm, Inc.
SHEFFIELD DIV., ARMCO STEEL
CORP.
Stahlwerke Sudwestfalen A.G.
THOR POWDER TOOL CO.
Uddeholms Aktiebolag
Uddeholm Co. of America
U. S. STEEL EXPORT CO.
VAREL MFG. CO.
Westinghouse Air Brake Co., L.
Roi Div.

ROOF SUPPORTS

SKINNING GROVE IRON CO. LTD.

SETS—STEEL

Allison Steel Mfg. Co.
August Thyssen-Hütte A.G.
Bethlehem Steel
Bochumer Eisenhütte Heintemann
& Co.
Chapman-Dyer Steel Co.
COLORADO FUEL & IRON
CORP., THE
Commercial Shearing & Stamping
Co.
Fagersta Steels Pacific, Inc.
Guest Keen Iron & Steel Co., Ltd.
Roth Erde Eisenwerk G.m.b.H.

Yieldable Steel

Bethlehem Steel
Fagersta Steels Pacific, Inc.

STOPERS

See Drills, Rock

SURVEYING

INSTRUMENTS

See also Engineering and Draft-
ing Equipment; Exploration
Equipment

Abem Company
Ainsworth & Sons, Inc., Wm.
Atkins Technical Inc.
Bausch & Lomb Optical Co.
Berger & Sons, Inc., C.L.
Brunton Transit—see Wm. Ains-
worth & Sons, Inc.
John Davis & Son, Ltd.
Detectron Div., Computer-Measure-
ment Co.
Dietzen Co., Eugene
Eberline Inst. Div.—Reynolds Eleet.
& Eng. Co.
Geo-Optic Co. Inc.
Gurley, W. & L.E.
International Geophysics, Inc.
Kern Instruments, Inc.
Keuffel & Esser Co.
Laisco—Los Angeles Scientific In-
strument Co.
LONGYEAR CO., E. J.
Lufkin Rule Co.
Menlo Research Lab.
Nucleonic Corp. of America
Precision Radiation Instruments,
Inc.
Radisc Co., Inc., The
Rocky Mountain Instrument Co.
Universal Atomics
White Instrument Co., David
WILD HEERBRUGG INSTRU-
MENTS, INC.

SWITCHES, RAIL

See Track and Accessories

TABLES

See Concentrators

TANKS, STORAGE

See Thickeners and Tanks;
Agitators and Conditioners
Aluminum Co. of America
BARBER-WEBB CO., INC.
Bethlehem Steel
Butler Mfg. Co.

Colonial Plastics Mfg. Co.
Columbian Steel Tank Co.
DENVER EQUIPMENT CO.
DINGLEWERK A.G.
FLUOR PRODUCTS CO.
Gutehoffnungshutte, A.G.
HEAD WRIGHTSON STOCKTON
FORGE LTD.
Hirsch Bros. Machine Co. Inc.
INTERNATIONAL B. F. GOOD-
RICH CO.
Knapp & Bates, Ltd.
Lead Lined Iron Pipe Co.
National Tank & Pipe Dept., Simp-
son Engrd. Wood Products Co.
Ogden Iron Works Co.
SOUTHWESTERN ENGR. CO.
U. S. Rubber Co.
U. S. Steel Co.
U. S. STEEL EXPORT CO.

TELEPHONES

See Communications

TELEVISION,

INDUSTRIAL

DICKINSON LABORATORIES,
INC.
Du Mont Laboratories, Inc., Allen B.
General Electric Co., Apparatus
Sales Div.
GRAYBAR ELECTRIC CO., INC.
Hitachi, Ltd.
Hycon Mfg. Co.
INTERNATIONAL GENERAL
ELECTRIC CO.

TESTING

See Laboratories

THICKENERS

See also Cyclones

STEEL TANKS

Allison Steel Mfg. Co.
Baker Perkins Ltd.
BARBER-WEBB CO., INC.
Bethlehem Steel
Bird Machine Co.
Butler Mfg. Co.
Columbian Steel Tank Co.
Davison & Co., (Hexham) Ltd
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
Dorr-Oliver G.m.b.H.
Federal Pipe & Tank Company
Gregg Co., Ltd., The
Gutehoffnungshutte, A.G.
HACK ENG. CO.
HEAD WRIGHTSON, STOCKTON
FORGE, LTD.
Hirsch Bros. Machinery Co.
Hydraulic Supply Mfg. Co.
Infleco, Inc.
INTERNATIONAL B. F. GOOD-
RICH CORP.
Kaiser Steel Corp.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
Michigan Pipe Co.
Miners Foundry & Mfg. Co.
Morse Bros. Machinery Co.
Ogden Iron Works Co.
Pollock Co., The Wm. B.
Sanford-Day Iron Works Inc.
STEARNS-ROGER MFG. CO.
U. S. Steel
U. S. STEEL EXPORT CO.
Washington Iron Works
Washington Mach. Co.
WEDAG
Wilmet Engineering Co.
Yuba Consolidated Indus. Mining
Div.

THICKENERS

Allison Steel Mfg. Co.
Bethlehem Steel
Butler Mfg. Co.
Chain Belt Co.
Columbian Steel Tank Co.
Davison & Co., (Hexham) Ltd.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
Dorr-Oliver G.m.b.H.
Eagle Iron Works
EIMCO CORP., THE
Float-Treat—See Chain Belt Co.
HARDINGE CO., INC.
Hoyl & Patterson, Inc.
Hirsch Bros. Machy. Co.
Infleco, Inc.
International Combustion Ltd.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
Link-Belt Co.
Miners Foundry & Mfg. Co.
Morse Bros. Machinery Co.

National Tank & Pipe Co.
PETERSON FILTERS & ENGR.
CO.
SANTA FE TANK DIV., FLUOR
PRODS. CO.
STEARNS-ROGER MFG. CO.
Stokes & Co., Ltd., R. O.
WEDAG
WEMCO—SEE WESTERN MA-
CHINERY CO.
WESTERN MACHINERY CO.
Westfälische Maschinenbau
G.m.b.H.

WOOD TANKS

Bagac—See Mahogany Importing
Co.
DENVER EQUIPMENT CO.
Dorr-Oliver G.m.b.H.
Federal Pipe & Tank Co.
FLUOR PRODUCTS CO.
Mahogany Importing Co.
Michigan Pipe Co.
Morse Bros. Machine Co.
National Tank & Pipe Co.
SANTA FE TANK DIV., FLUOR
CORP.
Windeler Co., Ltd., George

TIES, TRACK

See Track and Accessories

TIMBER

MINE

Koppers Co., Inc.
Osmose Wood Preserving Co. of
America, Inc.
Stanton & Son, Inc., E. J.

SHAFT GUIDES

Bagac—See Mahogany Importing
Co.
General Hardwood Co.
Koppers Co., Inc.
Stanton & Sons, Inc., E. J.
TIMBER FRAMING MACHINES
DENVER EQUIPMENT COM-
PANY
Goodman Mfg. Co.
STEARNS-ROGER MFG. CO.

TIRES AND TUBES,

OFF-HIGHWAY

Firestone Tire & Rubber Co., The
GATES RUBBER CO.
The General Tire & Rubber Co.
GOODRICH CO., THE B. F.
GOODYEAR INTERNATIONAL
CORP.
Goodyear Tire & Rubber Co.
INTERNATIONAL B. F. GOOD-
RICH
U. S. Royal—see U. S. Rubber
United States Rubber Indl.
Vacu-Lug Traction Tyres (Over-
seas) Ltd.

TORQUE CONVERTERS

SEE TRANSMISSIONS

TRACK & ACCESSORIES

RAIL AND TIES, STEEL

Aldon Co., The
Allison Steel Mfg. Co.
Bethlehem Steel
Brown Boveri & Cie A.G.
C F & I—SEE COLORADO FUEL
& IRON CORP., THE
Central Frog & Switch Co., The
Coeur d'Alene Hardware & Foundry
Co.
COLORADO FUEL & IRON
CORP.
Gregg Co., Ltd., The
United States Steel Corp. Columbia-
Geneva Div.
U. S. Steel Corp., Tennessee Coal &
Iron Div.
UNITED STATES STEEL EXPORT
CO.

SWITCHES, FROGS, CROSSINGS,
ETC.

Aldon Company, The
AMERICAN BRAKE SHOE CO.,
AMERICAN MANGANESE
STEEL DIV.
AMERICAN BRAKE SHOE CO.,
EXPORT DIV.
AMERICAN MINE DOOR CO.

Atlas Car & Mfg. Co., The
Bethlehem Steel
British Insulated Callender's Ltd.
CARD IRON WORKS CO., THE
C.
Central Frog & Switch Co., The
EIMCO CORP., THE
Electri-Throw—See American Mine
Door Co.
Gregg Co., Ltd. The
Gutehoffnungshutte, A.G.
Hadfields Ltd.
Hockensmith Corp., The
Jim Crow—see the Aldon Company
Koppers Co., Inc.
Nolan Co., The
Pettibone-Mulliken Corp.
SALZGITTER MASCHINEU
AKTIENGESellschaft
Samson—see the Aldon Co.
Taylor-Wharton Iron & Steel Co.
U. S. Steel Corp. Columbia-Geneva
Div.
UNITED STATES STEEL EXPORT
CO.
Weir Kilby Corp.

TRACTORS &**ATTACHMENTS**

See Engine Exhaust Condition-
ers, Underground

FORK LIFT TRUCKS

Hyster Co.

TRACTORS

Agricat—see Joost Mfg. Co.
ALLIS-CHALMERS MFG. CO., IN-
DUSTRIES GROUP
American M.A.N. Corp.
Autocar—see The White Motor Co.,
Autocar Div.
Brown Corp. (Sales) Ltd., David
BROWN INDUSTRIES, DAVID
Caterpillar Tractor Co.
CLARK EQUIPMENT CO., CON-
STRUCTION MACHY. DIV.
CURTISS-WRIGHT CORP., SOUTH
BEND DIV.
John Deere Industrial Div.
Drott Mfg. Corp.
EIMCO CORP., THE
GENERAL MOTORS CORP.,
EUCLID DIV.
GENERAL MOTORS OVERSEAS
OPERATIONS
Greenwood & Batley Ltd.
Hough Co., The Frank G.
Hunslet Engine Co.
INTERNATIONAL HARVESTER
CO.
Joost Manufacturing Co.
JOY MFG. CO.
Kaelble, Carl G.m.b.H.
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.—SEE DIESEL ENERGY
CORP.
LE TOURNEAU WESTINGHOUSE
CO.
MACK TRUCKS, INC.
Mannesmann Export G.m.b.H.
MICHIGAN TURBO-DOZER—SEE
CLARK EQUIPMENT CO.
MRS Mfg. Co.
Napco Industries, Inc.
Oliver Corp., The
Sheppard Co., R.H.
SOUTHWESTERN ENGINEERING
CO.
TOURNATRATORS—SEE LE-
TOURNEAU-WESTINGHOUSE
CO.
UNIMOG—SEE CURTISS-WRIGHT
CORP., SOUTH BEND DIV.
Westfall Equipment Co.
Vickers-Armstrongs (Engineers)
Ltd.
VICKERS-ARMSTRONGS (TRAC-
TORS) LTD.
Westinghouse Equipment Co.
Westinghouse Air Brake Co. (Pa.)
Westinghouse Air Brake Co., Le
Roi Div.
White Motor Co., The, Autocar Div.

ATTACHMENTS

ALLIS-CHALMERS MANUFAC-
TURING CO., CONST.
MACHY. DIV.
AMERICAN BRAKE SHOE CO.,
AMERICAN MANGANESE
STEEL DIV.
American Tractor Equipment Co.
Athy Products Corp.
BUCTUS-ERIE—SEE INTERNA-
TIONAL HARVESTER EX-
PORT CO.
Caterpillar Tractor Co.
CLARK EQUIPMENT CO.,
CONST. MACHY. DIV.
Craig Carroll Co.
CURTISS-WRIGHT CORP.,
SOUTH BEND DIV.

John Deere Industrial Div.
Drott Mfg. Corp.
EIMCO CORP., THE
Electric Steel Foundry Co.
Gar Wood Industries, Inc.
GENERAL MOTORS OVERSEAS
OPERATIONS
Heil Co., The
Hercules Gallion Products, Inc.
HOUGH—SEE INTERNATIONAL
HARVESTER EXPORT CO.
Hough Co., The Frank G.
Hunslet Engine Co.
Hyster Co.
INTERNATIONAL HARVESTER
CO.
INTERNATIONAL HARVESTER
EXPORT CO.
Joost Manufacturing Co.
JOY MFG. CO.
Kaelble, Carl G.m.b.H.
LE TOURNEAU-WESTINGHOUSE
CO.
LIBU SHOVEL CO., AB.
Minneapolis-Moline Co.
M-R-S Manufacturing Company
Oliver Corp., The
Pacific Car & Foundry Co.
PULLMAN—SEE INTERNATIONAL
AL HARVESTER EXPORT
CO.
Service Supply Corp.
SKOOKUM CO. INC., THE
SOUTHWESTERN ENGINEERING
CO.
Taylor-Wharton Iron & Steel Co.
TOURNAPULL—SEE LE TOUR-
NEAU-WESTINGHOUSE CO.
Tractomotive Corp.
UNIMOG—SEE CURTISS-WRIGHT
CORP., SOUTH BEND DIV.
Vickers-Armstrongs (Engineers)
Ltd.
VICKERS-ARMSTRONGS (TRAC-
TORS) LTD.
Westfall Equipment Co.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Roi Div.
Yuba Consolidated Industries, Inc.

TRAIN LOADER SYSTEMS

See also Loaders; Cars

COUPLED CONVEYOR CARS

HACK ENGINEERING CO.
Sheepbridge Equip. Ltd.
Universal Dredge Mfg. Co.

SLUSHER TRAIN

Coeur d'Alene Hardware & Foundry
Co.
EIMCO CORPORATION
JOY MFG. CO.
MACHINERY CENTER INC.
Sanford-Day Iron Works Inc.
Vulcan Iron Works Co.

TRAMMERS

See Locomotives

TRAMWAYS, AERIAL**BUCKETS**

AMERICAN BRAKE SHOE CO.,
AMERICAN MANGANESE
STEEL DIV.
BRITISH ROPEWAY ENG. CORP.
Irwin Sensenich Corp.
Mitchell Ropeways Ltd.
RIBLET TRAMWAY CO.
Ropeways Ltd.
Sanford-Day Iron Works, Inc.
Shepard Niles Crane & Hoist Corp.
STEARNS-ROGER MFG. CO.
U. S. Steel Corp., American Steel &
Wire Div.
Washington Iron Works

CABLE

Bethlehem Steel
British Ropes Ltd.
BRITISH ROPEWAY ENGINEER-
ING CO., LTD.
Canada Wire & Cable Co., Ltd.
Mitchell Ropeways Ltd.
RIBLET TRAMWAY CO.
ROEBLINGS SONS CORP.
Ropeways Ltd.
SAUERMAN BROS., INC.
U. S. Steel

United States Steel Corp., Colum-
bia-Geneva Div.
UNITED STATES STEEL
EXPORT CO.
Washington Iron Works
Whitcomb Co., Ltd., The

TOWERS

Allison Steel Mfg. Co.
BRITISH ROPEWAY ENG. CORP.
Gregg Co., Ltd., The
Mitchell Ropeways Ltd.
RIBLET TRAMWAY CO.
Ropeways Ltd.
SAUERMAN BROS., INC.
STEARNS-ROGER MFG. CO.
TELLURIDE IRON WKS.
U. S. STEEL EXPORT CO.
Washington Iron Works

TRANSFERS, CAR

AMERICAN MINE DOOR COM-
PANY
Atlas Car & Mfg. Co., The
CANTON—SEE AMERICAN MINE
DOOR COMPANY
CARD IRON WORKS CO., THE
C. S.
EIMCO CORP., THE
Gregg Co., Ltd. The
Mayo Tunnel & Mine Equip.
McDowell Co., Inc.
Sanford-Day Iron Works Inc.
TELLURIDE IRON WORKS CO.
United States Steel Corp.
Washington Iron Works
Yuba Consolidated Industries, Inc.

TRANSMISSIONS**AND TORQUE****CONVERTERS**

A. E. C. Ltd.
ALLISON—SEE GENERAL MO-
TORS OVERSEAS OPERA-
TION
American Blower Div. of American
Standard
Barker, Davies & Co.
Caterpillar Tractor Co.
Cleveland Worm & Gear Co., The
Dodge Mfg. Corp.
Four Wheel Drive Auto Co., The
FULLER MFG. CO.
General Motors Corp., Allison Div.
GENERAL MOTORS OVERSEAS
CORP.
Koppers Co., Fast's Coupling Dept.
Lima Electric Motor Co.
National Supply Co., The
North British Locomotive Co. Ltd.
Oliver Iron & Steel Corp.
Philadelphia Gear Works, Inc.
Renold Chains Ltd.
Rees Pulley Co.
Reliance Electric & Engineering Co.
Schneider Mfg. Corp.
Sheepbridge Engineering Ltd.
Sterling Electric Motors, Inc.
Twin Disc Clutch Co.
U. S. Electrical Motors, Inc.
Western Gear Corp. (Lynwood)

TRIPPERS

See Conveyor Equipment

TROLLEY EQUIPMENT

See also Locomotives

British Insulated Callender's Ltd.
COLORADO FUEL & IRON CORP.
Elreco Corp., The
INTERNATIONAL B. F. GOOD-
RICH CORP.
Jeffrey Mfg. Co.
Link-Belt Co.
NATIONAL MINE SERVICE CO.
Ohio Brass Co.
Ohio Hoist & Mfg. Co.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.

TROMMELS

See Screens, Grizzlies, and
Accessories

TRUCKS

See Cars, Mine

TRUCK AND TRAILERS

See also Haulage Units

ON-HIGHWAY

A. E. C. Limited
Allison Steel Mfg. Co.
American M.A.N. Corp.
Autocar—see White Motor Co., The,
Autocar Trucks Div.
Butler Mfg. Co.
CW—SEE CURTISS-WRIGHT
CORP., SOUTH BEND DIV.
Chrysler Corp., Dodge Div.
CURTISS-WRIGHT CORP., SOUTH
BEND DIV.
Dart—See K-W Dart Truck Co.
Differential Steel Car Co.
FWD—Four Wheel Drive Auto Co.,
The
Fruehauf Trailer Co.
Gallion Allsteel Body Co.
General Motors Corp., GMC Truck
& Coach Div.
GENERAL MOTORS OVERSEAS
OPERATIONS
Hercules Gallion Products, Inc.
Hercules Steel Products
INTERNATIONAL—SEE INTER-
NATIONAL HARVESTER EX-
PORT CO.
INTERNATIONAL HARVESTER
CO.
INTERNATIONAL HARVESTER
EXPORT CO.
Kaelble, Carl G.m.b.H.
Kenworth—See K-W Dart
KLOCKNER-HUMBOLDT-DEUTZ,
A. G.
Koehring Co.
MACK TRUCKS INC.
Mannesmann Export G.m.b.H.
Moab Drilling Co.
Napco Industries, Inc.
White Motor Co., The, Autocar
Trucks Div.
Willys Motors, Inc.
Winter-Weiss Co., The
Yuba Consolidated Industries Inc.

OFF-HIGHWAY

A. E. C. Limited
Athy Products Corporation
Augsburg-Nurnberg A.G., Maschin-
enfabrik (M.A.N.)
Autocar—see The White Motor Co.,
Autocar Trucks Div.
Aveling-Barford, Ltd.
Butler Mfg. Co.
CW—SEE CURTISS-WRIGHT
CORP., SOUTH BEND DIV.
Chrysler Corp., Dodge Div.
CURTISS-WRIGHT CORP., SOUTH
BEND DIV.
Dart—See K-W Dart Truck Co.
Differential Steel Car Co.
Easton Car & Construction Co.
EUCLID—SEE GENERAL MO-
TORS OVERSEAS OPERA-
TIONS
EUCLID DIV., GENERAL MO-
TORS CORP.
FWD—Four Wheel Drive Auto Co.,
The
Fruehauf Trailer Co.
Gallion Allsteel Body Co.
GENERAL MOTORS CORP.,
EUCLID DIVISION
GENERAL MOTORS OVERSEAS
OPERATIONS
GETMAN BROS. MFG. DIV. INC.
Heil Co., The
Hercules Gallion Products, Inc.
Hercules Steel Products Co.
INTERNATIONAL—SEE INTER-
NATIONAL HARVESTER EX-
PORT CO.
INTERNATIONAL HARVESTER
CO.
INTERNATIONAL HARVESTER
EXPORT CO.
Kaelble, Carl G.m.b.H.
Kenworth Motor Truck Corp.
Koehring Co.
Landis Steel Co.
LE TOURNEAU-WESTINGHOUSE
CO.
MACK TRUCKS INC.
Marmon-Herrington Co., Inc.
Moab Drilling Co.
Napco Industries, Inc.
Ortrac, Inc.
SCOOT-CRETE—SEE GETMAN
BROS. MFG. DIV., INC.
TOURNAHOPPER—SEE LE
TOURNEAU-WESTINGHOUSE
CO.
TOURNAROCHER—SEE LE
TOURNEAU-WESTINGHOUSE
CO.

Manufacturers' Complete Names and Ad-
resses are listed on the last pages of this
yellow section. Advertisers in this issue
are listed in boldface capital letters.

Tungsten Carbide Products

Westinghouse Air Brake Co. (Pa.)
White Motor Co., The Autocar
Trucks Div.
Willys Motors, Inc.
Yuba Consolidated Industries Inc.

TRUCK RADIATORS

L & M RADIATORS

TRUCK OR TRAILER BODIES

Allison Steel Mfg. Co.
Columbian Steel Tank Co.
Differential Steel Car Co.
Easton Car & Construction Co.
Fruehauf Trailer Co.
Galion Allsteel Body Co.
Gar Wood Industries Inc.
GENERAL MOTORS OVERSEAS
OPERATIONS

Gregg Co., Ltd., The
Hell Co., The
Hercules Gailon Products, Inc.
Hercules Steel Products Co.
Kenworth Motor Truck Co.
Landis Steel Co.
Penn—see Hockensmith Corp.
Winter-Weiss Co., The

ELECTRIC WHEEL DRIVE TRUCK

Greenwood & Batley Ltd.

TUNGSTEN CARBIDE PRODUCTS

Adamas Carbide Corp.
AMERICAN MANGANESE STEEL
DIV., AMERICAN BRAKE
SHOE CO.
AMERICAN BRAKE SHOE CO.,
EXPORT DIV.
American Coldset Corp.
ATLAS COPCO, AB SWEDEN
ATLAS COPCO, INC.
BRUNNER & LAY, INC.
Carboloy—see General Electric Co.
The Cementation Corp.
CHRISTENSEN DIAMOND PROD-
UCTS CO.
Haynes Stellite Co.
HOLMAN BROS. LTD.
INTERNATIONAL GENERAL
ELECTRIC CO.
Intra-Set—see Brunner & Lay, Inc.
Junction Bit & Tool Co.
KENNAMETAL INC.
LONGYEAR CO., E. J.
Metal Carbide Corp.
National Carbon Co.
ROK-BITS—SEE BRUNNER &
LAY, INC.
SMIT & CO. INC., ANTON
STOODY CO.
Svenska Motorborr AG
Uddeholm Co. of America
Uddeholms Aktiebolag
U. S. STEEL EXPORT CO.
VAREL MANUFACTURING CO.
Vascoloy-Ramet Corp.
WESTERN ROCK BIT MFG. CO.

VALVES

ALLEN-SHERMAN-HOFF PUMP
CO. THE
ALLIS-CHALMERS MFG. CO.
ACF Industries, Inc., American Car
& Foundry Div.
AMERICAN BRAKE SHOE CO.
AMERICAN MANGANESE
STEEL DIV.
American Chain & Cable Co., Inc.
R P & C Valve Div.
Conflow, Ltd.
Crane Co.
DENVER EQUIPMENT COM-
PANY
Electric Steel Foundry Co.
Farris Engineering Corp.
Farval Corp., The
FLEX-CHECK—SEE THE ALLEN-
SHERMAN-HOFF PUMP CO.
Flexible Valve Corp.
Gallagher Co.
General-American Valve Co.
Goodrich Co., B. F.
Grinnell Co., Inc.
Grinnell-Saunders—see Grinnell
Co., Inc.
Haselton—see Barrett, Haentjens &
Co.
Hemmelich, Hermann
HOLMAN BROTHERS LTD.
Hose Accessories Co.
Inflico, Inc.
INTERNATIONAL B. F. GOOD-
RICH
Leden Mfg. Co.
Masco Grigaby—see Mine & Smel-
ter Supply Co., The
McDowell Co., Inc.
McNally Pittsburgh Co.
MINE & SMELTER SUPPLY CO.

Minneapolis-Honeywell Regulator
Co., Industrial Div.
Ohio Brass Co.
PACIFIC PIPE CO.
KSB Klein, Schanalin & Becker
United States Rubber Co.
Victaulic Co. of America
Walworth Co.
WESTERN PRECIPITATION
CORP.
Westinghouse Air Brake Co.,
Industrial Products Div.
Wilkinson Linatex Co., Ltd.

VENTILATION

EQUIPMENT

BRATTICE CLOTH AND TUBING
ABC—SEE AMERICAN BRATTICE
CLOTH CORP.
AMERICAN BRATTICE CLOTH
CORP.
Bemis Bro. Bag Co.
Hanover Industries, Inc.
HUMBOLDT, KLOCKNER-HUM-
BOLDT-DEUTZ AG
INTERNATIONAL B. F. GOOD-
RICH CORP.
KOROSEAL—SEE INTERNA-
TIONAL B. F. GOODRICH
Rubber Improvement Ltd.

MINE FANS AND BLOWERS

American Air Filter Co., Inc.
American Blower Div. of American
Standard
AXIVANE—SEE JOY MFG. CO.
Browlie—see Sanford-Day Iron
Wks.
Carrier Corp.
Cleveland Worm & Gear Co., The
Coppus Engineering Corp.
Demag A.G.
DINGLEWERKE AG
FRASER & CHALMERS ENG.
WORKS

GRAYBAR ELECTRIC CO., INC.
Gutehoffnungshutte, A.G.
Hitachi Ltd.
HOLMAN BROS. LTD.
INGERSOLL-RAND CO.
International Engr., Inc.
Jeffrey Mfg. Co.
John Wood & Sons, Ltd.
JOY MFG. CO.
Koppers Co., Inc.
Mannesmann Export G.m.b.H.
Mine Safety Appliance Co.
MINING ENGINEERING CO., LTD.
NORTHERN BLOWER CO.
Robbins & Myers, Inc.
Roots-Connorsville Blower
Sanford-Day Iron Wks.
Sturtevant Eng. Co. Ltd.
Techn. Ind. en Handelsonderneming
Toret Manufacturing Co.
Turbo-Maschinen A.G.
U. S. Hoffman Machinery Corp.
WEDAG (WESTFALIA DINNEN-
DAHL GROPPPEL AG)
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.
Westinghouse Electric Corp., Sturte-
vant Div.

VENTILATION PIPE AND TUBING

ABC—SEE AMERICAN BRATTICE
CLOTH CORP.
Amalir—see Cementation Co., Ltd.
The
AMERICAN BRATTICE CLOTH
CORP.

Armo Drainage & Metal Products,
Inc.

Bemis Bro. Bag Co.
Carrier Corp.

Cementation Co. Ltd., The
Coeur d'Alene Hardware & Foundry
Co.

Colonial Plastics Mfg. Co., The
DeLaval Steam Turbine Co.

DINGLEWERKE AG
du Pont de Nemours & Co., Inc.

Fagerfabrics Div.
Fagerfabrics Div.
Flexible Ducting

Flexible Tubing Corp.
GOODRICH CO., THE B. F.

Hanover Industries, Inc.
INTERNATIONAL B. F. GOOD-

RICH
Jeffrey Mfg. Co.

Johns-Manville Sales Corp.
MINE VENT—SEE AMERICAN

BRATTICE CLOTH CORP.
MINING ENGINEERING CO.,

LTD.
NAYLOR PIPE CO.

NEOLON—SEE AMERICAN
BRATTICE CLOTH CORP.

Rubber Improvement Ltd.
Sheepbridge Equip. Ltd.

Spiratube—see Flexible Tubing
Corp.

TELLURIDE IRON WKS.
Tort Manufacturing Co.
Transite—see Johns-Manville
Ventube—see du Pont de Nemours
& Co., Inc., Fabrics Div.

VIBRATORS

See Bins, Chutes and Accessories

WASHERS, LOG

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP

Baker Perkins Ltd.
Barkers—see Washington Iron
Works

Conveyor Corp.
Davison & Co., (Hexham) Ltd.

Eagle Iron Works
FRASER & CHALMERS ENGR.
WORKS

Gruendler Crusher & Pulveriser Co.
Iowa Mfg. Co.

Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. & Engr.
Corp.

KLOCKNER-HUMBOLDT-DEUTZ,
A. G.

Knapp & Bates
LAKE SHORE INC.

LINK-BELT CO.
Lippmann Engineering Works

MCLANAHAN & STONE CO.
McNally Pittsburgh Co.

Pioneer Engr. Div., Poor & Co. Inc.
Pioneer Engr. Div., Poor & Co. Inc.

Scott's Concentrators
Smith Engineering Works

Stephens-Adamson Mfg. Co.
Universal Engr. Corp.

Washington Iron Works
Washington Machinery Co.

WEMCO—SEE WESTERN MA-
CHINERY CO.

WESTERN MACHINERY CO.
Yuba Mining Co.

WELDING

EQUIPMENT

HARD FACING

Abrasaweld—see Lincoln Electric
Co.

Aircro—see Air Reduction Sales Co.
Air Reduction Sales Co.

All-State Welding Alloys Co., Inc.
AMERICAN MANGANESE STEEL

DIV., AMERICAN BRAKE
SHOE CO.

AMERICAN BRAKE SHOE CO.,
EXPORT DIV.

Ampeco Metal, Inc.
AMPCO-Trode—see Ampeco Metal,
Inc.

Auto Arc Weld Mfg. Co., The
Chromo-Loy—see Resisto-Loy Co.

Crucible Steel Co. of America
Eutectic Welding Alloys Corp.

Fleetweld—see Lincoln Electric Co.
General Electric Co., Apparatus

Sales Div.
HARNISCHFEGGER CORP.

Haserome—see Haynes Stellite Co.
Haynes Stellite Co.

Haystellite—see Haynes Stellite Co.
Hobart Bros. Co.

Industrial Air Products Co.
International Nickel Co., Inc.

Isorod—see Resisto-Loy Co.
Jetweld—see Lincoln Electric Co.

KENNAMETAL, INC.
Lincoln Electric Co.

Linde Co.
Manga-Tone, N-M—see Resisto-Loy
Co.

Manga-Kote—see Resisto-Loy Co.
Motor Generator Corp.

Multimet—see Haynes Stellite Co.
Ranite—see Rankin Mfg. Co.

Resisto-Loy Co.
Rexweld—see Crucible Steel Co. of
Amer.

Roll Matrix—see All-State Welding
Alloys Co., Inc.

Sanford-Day Iron Works, Inc.
Seaco—see Stuls-Sickles Co.

Shieldarc—see Lincoln Electric Co.
STOODY CO.

Stuls-Sickles Co.
Taylor-Wharton Iron & Steel Co.

Union Carbide and Carbon Corp.
Haynes Stellite Co. Div.

Union Carbide and Carbon Corp.
Linde Air Products Co. Div.

Wall Colmonoy Corp.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.

WELDING RODS

Abrasaweld—see Lincoln Electric
Co.

Aircro—see Air Reduction Sales Co.
Air Reduction Sales Co.
All-State Welding Alloys Co., Inc.

AMERICAN BRAKE SHOE CO.,
AMERICAN MANGANESE
STEEL DIV.

American Chain & Cable Co., Inc.
Page Steel & Wire Div.

AMPCO Metal, Inc.
AMPCO-Trode—see AMPCO Metal,
Inc.

AMSCO—SEE AMERICAN BRAKE
SHOE CO.

Bridgeport Brass Co.
Crucible Steel Co. of America

Eutectic Welding Alloys Corp.
Fleetweld—see Lincoln Electric Co.

General Electric Co., Apparatus
Sales Div.

HARNISCHFEGGER CORP.
Haynes Stellite Co.

Hastelloy—see Haynes Stellite Co.
Hobart Bros. Co.

Ideal arc—see Lincoln Electric Co.
Industrial Air Products Co.

INTERNATIONAL GENERAL
ELECTRIC CO.

INTERNATIONAL B. F. GOOD-
RICH CORP.

International Nickel Co., Inc.
Jetweld—see Lincoln Electric Co.

KOROSEAL—SEE INTERNATIONAL
AL B. F. GOODRICH CORP.

Lincoln Electric Co.
Linde Co.

STOODY CO.
Stuls-Sickles Co.

Taylor-Wharton Iron & Steel Co.
Tweco-Lite Aluminum Welding

Cable—see Tweco Products,
Inc.

Tweco Products, Inc.
Union Carbide and Carbon Corp.

Linde Air Products Co. Div.
UNITED STATES STEEL EXPORT

CO.
Westinghouse Electric Corp.

WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.

WINCHES

See also Hoisting Equipment

ELECTRIC

All-State Welding Co., Inc.
AMERICAN BRAKE SHOE CO.,
EXPORT DIVISION

AMERICAN MANGANESE STEEL
DIV., AMERICAN BRAKE
SHOE CO.

AMPCO Metal, Inc.
Auto Arc-Weld Mfg. Co.

Industrial Air Products Co.
Linde Co.

STOODY COMPANY
U.S. STEEL EXPORT CO.

WINCHES

See also Hoisting Equipment

ELECTRIC

Austin Hopkinson & Co. Ltd.
Demag Aktiengesellschaft

EISENHUTTE PRINZ RUDOLPH,
A.G.

HARNISCHFEGGER CORP.
Hirsch Bros. Machine Co., Inc.

Hitachi, Ltd.
HOLMAN BROS. LTD.

INGERSOLL-RAND CO.
International Combustion Ltd.

John Wood & Sons, Ltd.
JOY MFG. CO.

Joy-Sullivan Ltd.
Kema (Kohn-Ehrenfelder Maschin-
enbau-Anstalt)

LAKE SHORE, INC.
Leden Mfg. Co.

Link-Belt Co.
Lug-All Co., The

Mobile Drilling, Inc.
Ohio Hoist & Mfg. Co.

Robbins & Myers, Inc.
Round Chain Co.

Sanford-Day Iron Wks.
SAUERMAN BROS., INC.

Shepard Niles Crane & Hoist Corp.
Stephens-Adamson Mfg. Co.

Vulcan-Denver—see Vulcan Iron
Works (Denver)

Vulcan Iron Works (Denver)
Westinghouse Electrical Corp.

Yale and Towne Mfg. Co.
Yuba Consolidated Indus. Mining
Div.

XANTHATES

See Reagents and Chemicals

SECTION II

Manufacturers' Index

Advertisers in Boldface

SECTION II contains an alphabetical list of the names and complete addresses of the principal manufacturers of specialized MINE-MILL-SMELTER

equipment. The names of manufacturers who are represented in this issue by catalogs or advertisements are printed in **BOLDFACE** type.

A

A & A Mfg. Co., Inc., 712 So. 12th Street, Milwaukee 4, Wisconsin
ABCs Scale Division, McDowell Co., Inc., 16360 Waterloo Road, Cleveland 10, Ohio
AEC Ltd., Southall, Middlesex, England
The Abem Company, Danderydgatan 11, Stockholm, Sweden
Abrams Aerial Survey Corp., 606 East Shilawsee St., Lansing 1, Mich.
A.C.F. Industries, Inc., American Car & Foundry Div., 30 Church St., N.Y. 8, N.Y.
ACKER DRILL CO., INC., P.O. BOX 839, 725 W. LACKAWANA AVE., SCRANTON 3, PA.
Acmé Electric Corp., 2001 Water St., Cuba, N.Y.
Adamas Carbide Corp., 121 Market St., Kenilworth, N.J.
Advances Car Mover Co., Inc., 112 N. Outagamie St., Appleton, Wis.
Aero Service Corp., 210 E. Courtland St., Phila. 30, Pa.
African Surveys (Proprietary Ltd.), 44 Negget St., Johannesburg, U. of So. Africa
Agence Minière & Maritime S. A., 2 Rue Van Bree, Anvers, Belgium
Ainsworth Wm. & Sons, Inc., 2151 Lawrence St., Denver 4, Colo.
Air Placement Equip. Co., 1000 W. 24th St., Kansas City 8, Mo.
Air Reduction Sales Co., 150 East 42nd St., New York 17, N.Y.
Aldon Company, The, 3338 Ravenswood Ave., Chicago 13, Ill.
Alemite Division, Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill.
ALIMAK CORPORATION, 306 AVILA ST., SAN FRANCISCO 23, CALIF.
ALIMAK-VERKEN AB, SKELLEPTEA 3, SWEDEN
Allen & Garcia Co., 332 S. Michigan Ave., Chicago 4, Ill.
ALLEN-SHERMAN-HOFF PUMP CO., THE, P.O. BOX 435, PAOLI, PA.
Allied Chemical Corp., 40 Rector St., New York 6, N.Y.
Allied Geophysics, P.O. Box 583, San Jose 6, Calif.
ALLIS-CHALMERS MFG. CO., ENGINE-MATERIALS HANDLING EQUIP., 1135 S. 76TH ST., MILWAUKEE 1, WIS.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP, MILWAUKEE 1, WIS.
ALLIS-CHALMERS MFG. CO., CONSTRUCTION MACHY DIV., BOX 512, MILWAUKEE 1, WIS.
Louis Allis Co., The, 427 E. Stewart St., Milwaukee 1, Wis.
Allison Steel Mfg. Co., P.O. Box 6047, Phoenix, Ariz.
ALLOY STEEL & METALS CO., 1948 EAST 55TH ST., LOS ANGELES 58, CALIF.
All-State Welding Alloys Co., Inc., 249-56 Ferris Ave., White Plains, N.Y.
Alphaduct Wire & Cable Co., P.O. Box 709, New Brunswick, N.J.
Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.
AB Alvenius Industrier, Kungsgatan 75, Eskilstuna, Sweden
Amag-Hilbert-Pegnitzhutte A.G., Werke Pegnitz, Nurnberg, Germany
Amercoat Corp., 4809 Firestone Blvd., Southgate, Calif.
American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky.
American Biltrite Rubber Co., Boston Woven Hose & Rubber Div., 29 Hampshire St., Cambridge, Mass.
American Blower Div. of American Standard, Detroit 32, Mich.
AMERICAN BRAKE SHOE CO., 539 5TH AVE., NEW YORK 36, N.Y.
American Brake Shoe Co., Ramapo Ajax Div., Export Div., 230 Park Ave., New York 17, N.Y.
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV., 359 E. 14TH ST., CHICAGO HEIGHTS, ILL.
AMERICAN BRAKE SHOE, EXPORT DIV., 539 5TH AVE., NEW YORK 36, N.Y.
AMERICAN BRATTICE CLOTH CORP., 230 S. BUFFALO ST., P.O. BOX 187, WARSAW, IND.

American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
American Chain & Cable Co., Helicord Gage Div., Bridgeport 2, Conn.
American Chain & Cable Co., Inc., American Cable Div., York, Pa.
American Chain & Cable Co., Inc., American Chain Div., Princess & Charles Sts., York, Pa.
American Chain & Cable Co., Inc., Hazard Wire Rope Div., Wilkes-Barre, Pa.
American Chain & Cable Co., Inc., R-P & C Valve Div., Tulpehocken St., Reading, Pa.
American Chain & Cable Co., Inc., Wright Hoist Div., 735 Hay St., York, Pa.
American Coldcast Corp., U.S. Highway 46, Teterboro, N.J.
AMERICAN CYANAMID CO., EXPLOSIVE DEPT., 30 ROCKEFELLER PLAZA, NEW YORK 20, N.Y.
AMERICAN CYANAMID CO., MINERAL DRESSING DEPT., 30 ROCKEFELLER PLAZA, NEW YORK 20, N.Y.
American Hoist & Derrick Co., 63 So. Robert St., Paul 7, Minn.
American Hoist & Derrick Co., Crosby-Laughlin Div., P.O. Box 570, Ft. Wayne, Ind.
American LaFrance, Div. Sterling Precision Corp., 100 E. LaFrance St., Elmira, N.Y.
American Locomotive Co., 30 Church St., N.Y., N.Y.
American Machine & Metals, Inc., East Moline, Illinois (Riehle Testing Machines Div.)
American M.A.N. Corp., 149 Broadway, New York 6, N.Y.
AMERICAN MANGANESE STEEL DIVISION, 359 E. 14TH ST., CHICAGO HEIGHTS, ILL.
AMERICAN MINE DOOR CO., 2971 DUEBER AVE., S. W. CANTON 6, OHIO
American Optical Company, Safety Products Div., 56 Mechanic St., Southbridge, Mass.
AMERICAN POTASH & CHEMICAL CORP., 3000 W. 6TH ST., LOS ANGELES 54, CALIF.
American Rubber Mfg. Co., 1145 Park Ave., Oakland 8, Calif.
American Smelting & Refining Co., Crandall Bldg., Salt Lake City, Utah
American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif.
AMERICAN ZINC SALES CO., 1630 PAUL BROWN BLDG., ST. LOUIS, MO.
Ampeco Metal, Inc., 1716 South 38th St., Milwaukee 46, Wis.
Anacosta Wire & Cable Co., 25 Broadway, New York City 4, N.Y.
Analytical Measurements, Inc., 585 Main St., Chatham, N.J.
Andres Stihl Maschinenfabrik, Waiblingen, Newstadt/Wurt, Germany
Apache Powder Co., Box 518, Benson, Arizona
Appleton-Atlas Car Mover Corp., 1421-25 S. 2nd St., Milwaukee 4, Wisconsin
Arizona Assay Office, 315 N. 1st St., P.O. Box 1145, Phoenix, Ariz.
Arizona Bag Co., 1502 So. 23rd Ave., Phoenix, Ariz.
ARIZONA TESTING LABORATORIES, 817 WEST MADISON ST., P.O. BOX 1888, PHOENIX, ARIZ.
Armco Drainage & Metal Products, Inc., 708 Curtis St., Middletown, Ohio
Armco Steel Corp., 708 Curtis St., Middletown, Ohio
Armour Alliance Industries, 16123 Armour St. N.E., Alliance, Ohio
Armour Chemical Division, 1355 West 31st St., Chicago 9, Ill.
Armstrong-Bray & Co., 5366 North Northwest Highway, Chicago 30, Ill.
ASEA ELECTRIC INC., 508 FIFTH AVE., N.Y.C. 36, N.Y.—SEE ASEA
ASEA, VASTERAS, SWEDEN
Askania-Werke A.G., Berlin-Friedenau, Germany
Athey Products Corp., 5651 West 65th St., Chicago 38, Ill.
Atlantic Refining Co., Inc., 260 So. Broad St., Philadelphia 1, Pa.
Atkins Technical Inc., 1276 W. 3rd St., Cleveland 13, Ohio
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland 10, Ohio
ATLAS COPCO, 545 FIFTH AVE., NEW YORK 17, N.Y.

ATLAS COPCO EASTERN, INC., 610 INDUSTRIAL AVE., PARAMUS, N.J.
ATLAS COPCO PACIFIC, INC., 938 BRITTAN AVE., SAN CARLOS, CALIF.
ATLAS COPCO. A. B. STOCKHOLM 1, SWEDEN
ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE
Augsburg-Nurnberg A. G., Maschinenfabrik (M.A.N.)—See American M.A.N. Corp.
August Thyssen-Hütte A. G., Franz-Leasestrasse 3, Dulsburg-Hamborn, W. Germany
Austin Hopkinson & Co., Ltd., Delta Works, Audenshaw, Manchester, England
Autair, Ltd., 75 Wigmore Street, London W. 1, England
Auto Arc-Weld Mfg. Co., The, 3615 Meech Ave., Cleveland 5, Ohio
Autocar Division, White Motor Co., Exton, Pa.
Aveling-Barford, Ltd., Grantham, Lincolnshire, England

B

B.I.F. Industries, Inc., 345 Harris St., Providence, R.I.
B-R-D CO. LTD., DUMBLEDEY LANE, ALDRIDGE, NR. WALSALL, STAFFS, ENGLAND
BARCOCK & WILCOX CO., BOILER DIV., THE, 161 EAST 43RD ST., NEW YORK 17, N.Y.
Baker Perkins Ltd., Westwood Works, Peterborough, England
BALDWIN-LIMA-HAMILTON CORP., 2232 PHILADELPHIA NAT. BANK BLDG., PHILADELPHIA 7, PA.
Baldwin-Lima-Hamilton Corp., Eddystone Div., Philadelphia 42, Pa.
BALDWIN-LIMA-HAMILTON CORP., LIMA-HAMILTON DIV., PHILADELPHIA 42, PA.
Band It Co., 48th & Dahlia, Denver 16, Colo.
Barber-Colman Co., Wheeled Instruments Div., 1300 Rock St., Rockford, Illinois
Barber-Greene Co., 400 North Highland Ave., Aurora, Illinois
BARBER-WEBB COMPANY, 3864 SANTA FE AVE., LOS ANGELES 58, CALIF.
Barco Mfg. Co., 500-530 N. Hough St., Barrington, Ill.
Barker, Davies & Co., Old Bank Chambers, Fentypridd, Glam. U.K.
Barrett, Haasjens & Co., P.O. Box 36, Hasleton, Pa.
Bath Iron Wks. Corp., Rm. 1738, West Chester, Pa.
Baukol, Philip J., 2054 University Ave., Berkeley, Calif.
Baugh & Lomb Optical Co., 68260 St. Paul St., Rochester 2, New York
Bavaria Maschinenfabrik, J. Hilber, Industriestrasse 34, Neu-Ulm (Donau) Germany
Baxter, Ltd., W. H. 71 Gelder Rd., Leeds 12, Yorkshire, England
Bay City Shovels, Inc., Bay City, Mich.
Becker-Prunte, GmbH, Datteln (Westfal) W. Germany
Beckett & Anderson Ltd., Dalmarnock Bridge, Rutherglen, Nr Glasgow, Scotland
Beckman Instruments, Inc., Scientific Instruments Div., 2500 Fullerton Road, Fullerton, Calif.
Beebe Bros., 2724 Sixth Ave., S. Seattle 4, Wash.
Bell Helicopter Corp., P.O. Box 482, Ft. Worth 1, Texas
Bemis Bro. Bag Co., 111 N. 4th St., Box 85, St. Louis 2, Mo.
Bendelari, F.N., First National Bank, Joplin, Mo.
Rendix Aviation Corp., Cincinnati Div., 3130 Wason Rd., Cincinnati 4, Ohio
Berger & Sons, Inc., C. L. 37 Williams St., Boston 19, Mass.
Berk & Co., Inc., F. W. 275 Brannan St., San Francisco 7, Calif.
Berk & Co., F. W., Park Place East, Wood-Ridge, N.J.
Bethlehem Steel Co., 701 E. Third St., Bethlehem, Penn.
Bethlehem Steel Co., Pacific Coast Div., 20th & Illinois Sts., San Francisco 19, Calif.
Bethlehem Steel Export Corp., 25 Broadway, New York 4, N.Y.
Bico, Inc., 3116 Valhalla Drive, Burbank, Calif.

Bin-Dicator Co., The, 13946 Kercheval Ave., Detroit 15, Mich.
 Bird Machine Co., South Walpole, Mass.
 Birdsboro Corp., Birdsboro, Pa.
 T. M. Birkett, Billington & Newton, Ltd., P.O. Box 201, Hanley, Stoke-on-Trent, Staffs, England
 Birtley Engineering Ltd., Market Place Chambers, West Bars, Chesterfield, England
 Bischoff-Werke KG, vorm. Pfingstmann-Werke, Heilbachstr. 84-86, Recklinghausen-Süd, Germany
 Bixby-Zimmer Engineering Co., 961 Abingdon St., Galesburg, Ill.
 Black & Deason, Box 1888, Salt Lake City 1, Utah
BLACK'S MINING EQUIPMENT, LTD., 44 MASON'S HILL, BROMLEY, KENT, ENGLAND
 Blagdon-Dunham Ltd., Framwellgate Works, Durham City, County Durham, Eng.
 Blaw-Knox Co., Blaw-Knox Div., Farmers Bank Bldg., Pittsburgh, Pa.
 Bochumer Eisenhütte Heintzmann & Co., Bochum, Germany
 Bohler, Gebr. & Co., AG, Hanns-Allee 221, Dusseldorf-Oberkassel, Germany
 Bonded Scale & Machine Co., 2173 So. 3rd St., Columbus 7, Ohio
 Booklime, Incorporated, 3735 South 3100 East St., Salt Lake City 9, Utah
 Booth Co., Inc., The, 353 W. 14th St., Salt Lake City 15, Utah
 Borg-Warner Ind.—see Morse Chain Co., N.Y.
 Bornmann-Brenner-Berlin, Blucherstrasse 28, Berlin S.W. 61, Germany
 Borsig, AG, Berliner Str. 19-27, Berlin-Tegel (Westsektor), Germany
 Boston Woven Hose & Rubber Co., P.O. Box 1071, Boston 3, Mass.
 E. Boydell & Co., Ltd., Elainore Road, Old Trafford, Manchester 16, England
BOYLES BROS. DRILLING CO., 1321 S. MAIN ST., SALT LAKE CITY, UTAH
 Boyles Bros. Drilling Co., Ltd., 1275-91 Parker St., Vancouver 6, B.C., Canada
 Braun & Co., C. F., Braun International Corp., (C. F. Braun & Co. of Canada, Ltd.), 1000 Fremont Avenue, Alhambra, Calif.
 Braun Chemical Co., 1363 So. Bonnie Beach Place, Los Angeles 54, Calif.
 Braun Corp., 2260 E. 15th St., Los Angeles 21, Calif.
 Braun-Knecht-Heiman Co., 1400 16th St., San Francisco 19, Calif.
 Bridgeport Brass Co., 30 Grand St., Bridgeport 2, Conn.
 Briggs & Stratton Corp., 2711 North Thirtieth St., Milwaukee 1, Wis.
 Bristol Co., The, P.O. Box 1700 MW Waterbury 20, Conn.
 British Insulated Callender's Cables, Ltd., 21 Bloomsbury St., London W.C. 1, England
BRITISH LABOUR PUMP CO. LTD., BLANDELL ST., LONDON N. 1, ENGLAND
 British Nylon Spinners, Ltd., 68 Knight Bridge, London, S.W. 1, England
 British Ropes Ltd., Doncaster, Yorkshire, England
 British Ropes Ltd., Export Sales Div., 52 High Holborn, London, England
BRITISH ROPEWAY ENGINEERING CO. LTD., PLANTATION HOUSE, MINCING LANE, LONDON E.C., ENGLAND
 Broadbent & Son, Ltd., Robert, Phoenix Ironworks, Stalybridge, England
 Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 16, Missouri
 David Brown Corp. (Sales) Ltd., 96-97 Piccadilly, London, W. 1, England
BROWN INC., DAVID, 999 BEECHER ST., SAN LEANDRO, CALIF.
 Brown, Industries, David, Meltham, Huddersfield, England
 Brown Boveri & Cie. AG, Mannheim, Germany
BRUNNER & LAY, INC., 9380 KING ST., FRANKLIN PARK, ILL.
 Buck & Associates, Carl, Essex Falls, N.J.
 Bucyrus-Erie Co., P.O. Box 56, South Milwaukee, Wis.
 Bucyrus-Erie Co., Drill Div., P.O. Box 324, Richmond, Ind.
 Buell Engineering Co., Inc., 70 Pine St., New York 5, New York
BULLARD CO. E. D., 2680 BRIDGEWAY, SAUSALITO, CALIF.
BURBRIDGE-PYBURN, RM. 414, MILLS BLDG., EL PASO, TEXAS
 Bush Engineering & Mfg. Co., 5 Lester Ct., Salt Lake City, Utah
 Butler Mfg. Co., 7490 E. 13th St., Kansas City 26, Mo.
 Byron Jackson Pumps, Inc., Subsidiary of Borg-Warner Corp., P.O. Box 2017A, Terminal Annex, Los Angeles, Calif.

C

C & D Batteries, Inc., Washington & Cherry Sts., Conshohocken, Pa.

Cable Belt Ltd., Longman Industrial Estate, Inverness, Scotland
 Calumet & Hecla, Inc., Calumet Div., 1 Calumet Ave., Calumet, Mich.
 Canada Wire & Cable Co., Ltd., P. S. "R," Toronto 17, Ontario, Canada
 Canadian Aero Services Ltd., 348 Queen St., Ottawa 4, Ontario, Canada
 Canadian Safety Fuse Co. Ltd., Brownsburg, Quebec, Canada
HARRY B. CANNON ASSOC., BOX 2432, LAKELAND, FLORIDA
 Canton Mfg. Co., 2408 13th St., N. E., Canton 5, Ohio
 Carbolineum Wood Preserving Co., 6683 N. 40th St., Milwaukee 9, Wis.
 Carborundum Co., The, Refractories Div., Perth Amboy, N.J.
CARD IRON WORKS CO., THE C. S., P.O. BOX 117, DENVER 1, COLO.
 Cardox Corp., 397 N. Michigan Ave., Chicago, Ill.
 Carlson Products Corp., 10225 Meech Ave., Cleveland 5, Ohio
 Carlyle Rubber Co., Inc., 103-107 Warren St., New York 7, N.Y.
 Carol Cable Co., 190 Middle St., Pawtucket, Rhode Island
 Carpcor Mfg. Inc., P.O. Box 3272, Station F, Jacksonville 6, Fla.
 Carrier Corp., Carrier Parkway, Syracuse, N.Y.
 Carrier Conveyor Corp., 211 N. Jackson St., Louisville 2, Ky.
 Caterpillar Tractor Co., Peoria, Illinois
CEAG, MUENSTER STR. 231, DORTMUND, GERMANY
 Cement Gun Co., Allentown, Pa.
 Cementation Co., Ltd., The, Bentley Works, Doncaster, Head office: 20 Albert Embankment, London SE 11.
 Central Frog & Switch Co., The, Box 95, Sta. O, Cincinnati 5, Ohio
 Central Mine Equipment Co., 6200 N. Broadway, St. Louis 15, Mo.
 Central Scientific Co., 1040 Martin Ave., Santa Clara, Calif.
 Centrifugal & Mechanical Industries, Inc., 146 President St., St. Louis 18, Mo.
 Chain Belt Co., 4701 West Greenfield Ave., Milwaukee 1, Wis.
CHAPMAN, WOOD & GRISWOLD, 536 JEFFERSON ST., N.E., ALBUQUERQUE, N.M.
 Chase Brass & Copper Co., 236 Grand St., Waterbury 20, Conn.
 Chasside Engineering Co. Ltd., Station Works, Hertford, Herts., England
 Chester Hoist—see National Screw & Mfg. Co.
 Chicago Eye Shield Co., 2727 W. Roscoe St., Chicago 18, Ill.
CHICAGO PNEUMATIC TOOL CO., EAST 44TH ST., NEW YORK 17, N.Y.
 Chiksan Co., 350 N. Pomona Ave., Brea, Calif.
CHRISTENSEN DIAMOND PRODUCTS CO., 1927 S 2ND WEST, P.O. 337, SALT LAKE CITY, UTAH
 Chrysler Corp.-Dodge Div., 21500 Mound Road, Detroit 31, Mich.
 Circle Wire & Cable Corp., 5500 Maspeth Ave., N. Maspeth, N.Y.
CLARK EQUIPMENT CO., CONSTRUCTION MACHINERY DIV., P.O. BOX 599, PIPESTONE PLANT, BENTON HARBOR, MICH.
 Cleveland Rock Drill Div., Westinghouse Air Brake Co., Cleveland, Ohio
 Cleveland Vibrator Co., The, 2828 Clinton Ave., Cleveland 13, Ohio
 Cleveland Wire Cloth & Mfg. Co., 3573 E. 78th St., Cleveland 5, Ohio
 Cleveland Worm & Gear Co., The, 3300 East 80th St., Cleveland 4, Ohio
 Climax Molybdenum Co., 500 Fifth Ave., N.Y. 36, N.Y.
 Climax Rock Drill & Engineering Works, Ltd., 4, Broad St. Place, London, E.C.2, England
 Clipper Belt Lacer Co., 974 Front Ave., N.W., Grand Rapids 2, Mich.
 Clyde Iron Works, Inc., Duluth 1, Minnesota
COAST MFG. & SUPPLY CO., BOX 71, LIVERMORE, CALIF.
COATES STEEL PRODUCTS CO., P.O. BOX 185, 1937 FRANKLIN AVE., GREENVILLE, ILL.
 Coeur d'Alene Hardware & Foundry Co., Box 969, Wallace, Idaho
 Coffing Hoist Div., Duff Norton Co., Danville, Ill.
COLEMAN CABLE & WIRE CO., 1980 RIVER ROAD, RIVER GROVE, ILL.
 Collier Insulated Wire Co., 240 Roosevelt Ave., Box 61, Pawtucket, R.I.
 Colonial Plastics Mfg. Co., 2685 E. 79th St., Cleveland 4, Ohio
COLORADO ASSAYING CO., THE, 2244 BROADWAY, DENVER 1, COLO.
COLORADO FUEL & IRON CORP., P.O. BOX 1920, DENVER 1, COLO.
COLUMBIA STEEL CASTING CO., INC., 923 N. W. JOHNSON ST., PORTLAND 9, ORE.
 Columbian Steel Tank Co., 1509 West 12th St., Kansas City 1, Mo.
 Combustion Engineering Inc., Raymond Div., 1132 West Blackhawk St., Chicago 22, Ill.
 Combustion Engineering, Inc., 200 Madison Ave., New York 16, New York

Commercial Shearing & Stamping Co., 1775 Logan Ave., Youngstown 1, Ohio
 Conflow, Ltd., Triumph Rd., Lenton, Nottingham, England
 Connecticut Telephone & Electric Corp., Meriden, Conn.
 Connelville Mfg. & Mine Supply Co., S. 4th St., P.O. Box 677, Connelville, Pa.
 Consolidated Pneumatic Tool Co. Ltd., 232 Dawes Rd., London, S. W. 6, England
CONSTRUCTION AGGREGATES, 120 S. LA SALLE ST., CHICAGO 3, ILLINOIS
 Construction Mach. Co., Box 120, Waterloo, Iowa
 Continental Conveyor & Equip. Co., Box 5142, Birmingham 12, Alabama
 Convoir Inc., P.O. Box 9671, Pittsburgh 26, Pa.
 Conveyor Co., The, 3260 East Slauson Avenue, Los Angeles 58, Calif.
 Cooper-Bessemer Corp., The, Mount Vernon, Ohio
 Coppus Engineering Corp., 344 Park Ave., Worcester 10, Mass.
 County Commercial Cars (SLS.) Ltd., Fleet, Aldershot, Hants.
COWIN & CO., INC., 1-18TH ST. S.W., BIRMINGHAM, ALA.
 Cranelius Company, Ltd., 12 Clarges St., London W. 1, England
 Craig Carroll Co., 55 S.E. Belmont, (Box 2208), Portland 14, Oregon
 Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.
 Crescent Belt Fastener Co., 381-4th Ave., New York 16, N.Y.
 Crosby Laughlin Div., Box 570, Fort Wayne, Ind.
 Crown Zellerbach Corp., Chem. Products Div., Camas, Wash.
 Crucible Steel Co. of America, Henry W. Oliver Bldg., Mellon Square, P.O. Box 2518 Pittsburgh 30, Pa.
 Crusher Eng. Div., Poor & Co., 400 Architects Bldg., Philadelphia 2, Pa.
 Cummins Engine Co., Inc., Fifth & Union St., Columbus, Ind.
CURTISS-WRIGHT CORP., SOUTH BEND DIV., 701 W. CHIWEPPA AVE., SOUTH BEND, INDIANA
 Curtiss-Wright Corp., Utica Div., Utica, Mich.

D

Dagenhardt-Utch KG, Eisem (KR-Siegen) Germany
 Dale, Wade M., 235 E. Polk St., Coaliga, Calif.
 Davey Paxman Co. Ltd., Standard Iron Works, Colchester, England
 Davey Compressor Co., 609 Franklin Ave., Kent, Ohio
 Davis, John, & Sons (Derby) Ltd., All Saints Works, Derby, England
 Davison & Co. (Hexham) Ltd., Hexam-on-Tyne, England
 Daystrom Inc., Daystrom-Weston Instr. Div., 614 Freylichhuyzen Ave., Newark 12, N.J.
 Dayton Rubber Co., Woodside Bldg., Greenville, S. C.
 Degendorfer, T. G., Box 840, Kellogg, Idaho
DEISTER CONCENTRATOR CO., 925 GLASGOW AVE., FORT WAYNE, IND.
 Deister Machine Co., 1933 E. Wayne St., Ft. Wayne 4, Ind.
 DeLaval Steam Turbine Co., 300 Nottingham Way, Trenton 2, N. J.
 Demag Aktiengesellschaft, Wolfgang-Reuter-Platz, Duisburg, Germany
 Demag Elektrometallurg GmbH, Wolfgang-Reuter-Platz, Duisburg, Germany
DENVER EQUIPMENT CO., Box 5268 (1400-17TH ST.), DENVER 17, COLO.
DENVER FIRE CLAY CO., 2301 BLAKE ST., P.O. BOX 5510, DENVER 17, COLORADO
 DeSousa & Co., J. E., Inc., 217 Broadway, New York, N.Y.
 Detectron Div., Computer-Measurements Co., Sylmar, Calif.
 Diamond Chain Co., Inc., 402 Kentucky Ave., Indianapolis 7, Ind.
DIAMOND DRILL CONTRACTING CO., SOUTH 18 STONE ST., P.O. BOX 4665, STATION B, SPOKANE, WASHINGTON
 Diamond Iron Works, Division Goodman Mfg. Co., Helsted St., & 48th Pl., Chicago 9, Ill.
DIAMOND TOOL RESEARCH CO., INC., 389 2ND AVE., N.Y. 10, N.Y.
 Dicalite Div., Great Lakes Carbon Corp., 612 So. Flower St., Los Angeles, Calif.
DICKINSON LABORATORIES, 1300 W. MAIN ST., BOX 7096, EL PASO, TEXAS
DIESEL ENERGY CORP., 82 BEAVER ST., NEW YORK, N.Y.—SEE KLOCKNER-HUMBOLDT-DEUTZ
 Dietzen Co., Eugene, 2425 North Sheffield, Chicago 14, Ill.
 Differential Steel Car Co., Findlay, Ohio
DINGLEWERKE AG, ZWEIBRUCKEN/PFALZ, GERMANY
 Dinga Magnetic Separator Co., 4719, West Electric Ave., Milwaukee 46, Wis.
 Dodge Mfg. Corp., S. Union St., Mishawaka, Ind.

Dolmar Maschinen Fabrik, Kedenburg Strasse 53-59, Hamburg-Wandsbeck, Germany
DORR-OLIVER INC., 77 HAVEMEYER LANE, STAMFORD, CONN.
 Dorr Oliver GmbH, Gustav-Freytag Strasse 9, Wiesbaden, Germany
 Dosco Overseas Engr. Ltd., Penn Road, Beaconsfield, Bucks, England
DOW CHEMICAL INTERNATIONAL LTD. S.A., ABBOTT ROAD BLDGS., MIDLAND, MICHIGAN
DOW CHEMICAL CO., THE, MIDLAND, MICH.
 Dowty Mining Equipment Ltd., Ashchurch, Tewkesbury, Glos., England
 Dravo Corp., Neville Island, Pittsburgh 25, Pa.
 Drilling Accessory & Mfg. Co., Inc., P. O. Box 5768, 2006 S. Industrial, Dallas, Texas
 Drott Mfg. Corp., 3126 S. 27th Street, Milwaukee 15, Wis.
 Ducon Co., 152 E. 2nd St., Mineola, N.Y.
 Dumont Laboratories, Inc., Allen, 750 Bloomfield Ave., Clifton, N.J.
 Dunham Mfg. & Sales Co., Gordon S., 853 Mission St., So. Pasadena, Calif.
 duPont de Nemours & Co., E. I. Chemicals Dept., duPont Bldg., Wilmington, Del.
 DuPont de Nemours & Co., Inc., Explosives Div., Wilmington 98, Delaware
 DuPont de Nemours & Co., Inc., Fabrics Div., Newburgh, N.Y.
 Dwight-Lloyd Div., McDowell Co., Inc., The Dynamic Div., Eaton Mfg. Co., 3307-14th Ave., Kenosha, Wisconsin

E

Eagle Crusher Co., Galion, Ohio
 Eagle Iron Works, 261 Holcomb Ave., Des Moines, Iowa
 Easton Car & Construction Co., Easton, Pa.
 Easton Manufacturing Co., Dynamatic Div., 3122 14th Ave., Kenosha, Wisconsin
 Eberhard Bauer GmbH, Esslingen Neckar, W. Germany
 Eberline Instrument Corp., 805 Early St., P.O. Box 279, Santa Fe, New Mexico
 EC&M Div. of Square D Co., 4500 Lee Rd., Cleveland 28, Ohio
 Economy Fuse & Mfg. Co., 2717 Greenview Ave., Chicago, Ill.
 Edison, Inc., Thomas A., Edison Storage Battery Div., West Orange, N.J.
 E. H. Edwards Co., P.O. Box 513, So. San Francisco, Calif.
 Eickhoff, Gebr. Maschinenfabrik u. Eisengiesserei GmbH, Bochum, Germany
EIMCO CORP., P.O. BOX 308, SALT LAKE CITY 16, UTAH
EISENHUTTE PRINZ RUDOLPH, A.G., DULMAN/WESTF. GERMANY
 Eisenwerke Mulheim/Meiderich A.G., (22a) Mulheim-Ruhr Postfach 420, Germany
 Electric Controller & Mfg. Co., 4514 Lee Road, Cleveland 28, Ohio
 Electric Machinery Mfg. Co., 800 Central Ave., Minneapolis 13, Minn.
 Electric Steel Foundry Co., 2141 NW 25th Ave., Portland 10, Ore.
ELECTRIC STORAGE BATTERY CO., EXIDE INDUSTRIAL DIVISION, RISING SUN & ADAMS AVES., PHILADELPHIA 26, PA.
 Electro Technical Labs Div., Mandrel Industries, 5134 Glenmont Drive, Houston 19, Texas
 Elektrokemisk A. S., 101 Park Ave., New York 17, N.Y.
 Elliott, D. H., P.O. Box 1007, Casper, Wyo.
ELLCOTT MACHINE CORP., 1611 BUSH ST., BALTIMORE 30, MD.
 Elreco Corp., 2900 Cornsany Ave., Cincinnati 25, Ohio
 Emery Industries, Inc., Carew Tower, Cincinnati 2, Ohio
 English Drilling Equipment Co. Ltd., Palace Chambers, Bridge St., Westminster, London, S.W. 1, England
 English Electric Export & Trading Co., Ltd., Stafford, England
 English Steel Corp., Ltd., River Don Works, Sheffield, England
 Ensign-Bickford Co., Hopmeadow St., P.O. Box 308, Simsbury, Conn.
 Enterprise Engr. & Mach. Co., 13th & Florida St., S.F. 10, Calif.
 Equipment Engineering Co., 9100 S. 150 East, Sandy Utah
EQUIPMENT ENGINEERS INC., 737 LOMA VERDE, PALO ALTO, CALIF.
 Erie Pump & Engine Works, 165 Glenwood Ave., Medina, N.Y.
 Eriez Mfg. Co., 291 Magnet Drive, Erie, Pa.
 Esch-Werke K.G., Duisberg, West Germany
 ESCO International, Graybar Bldg., 2519 Lexington Ave., New York 17, N.Y.
 Essex Wire Corp., 1601 Wall Street, Fort Wayne 6, Ind.
 Essex Wire Corp., Industrial Wire Prods., 2601 So. Adams, Marion, Indiana
 Essex Wire Corp., Parantite Wire & Cable Div., 1601 Wall St., Ft. Wayne, Ind.
 Eterline-Angus Co., Inc., P.O. Box 598, Indianapolis 6, Ind.

EUCLID DIVISION, SEE GENERAL MOTORS CORP.
 Euclid Electric & Mfg. Co., 50 Edwards St., Madison, Ohio
 Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing 58, N.Y.

F

Fa. Ten Pas & Co., 140 Zeglis, Alkmaar, Netherlands
 Fagersta AB, Fagersta, Sweden
 Fagersta Steels Pacific Inc., 1011 E. 61st St., Los Angeles 1, Calif.
 Fagertun Fabrikker, A/S, P.O. Box 22, Drammen, Norway
 Failing Co., Geo. E., 424 E. Broadway, Enid, Oklahoma
 Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.
 Fairchild Aerial Surveys, Inc., 224 E. 11th St., Los Angeles, Calif.
 Falk Corp., The, 3004 W. Canal St., Box 492, Milwaukee 1, Wis.
FAHRWERKE HOECHST AG, FRANKFURT (M)-HOECHST, WEST GERMANY
 Farris Engineering Corp., 400 Commercial Ave., Palisades Park, N.J.
 Farval Corp., The, 3300 E. 80th St., Cleveland, Ohio
 Fate-Root-Heath Co., The, Plymouth Locomotive Wks. Div., Plymouth, Ohio
 Federal Pipe & Tank Co., 6851 East Marginal Way, Seattle 8, Wash.
 Filter Fabrics, Inc., 1279 W. 3rd St., Cleveland 13, Ohio
 Filtration Engineers Div. American Machine & Metals, Inc., East Moline, Illinois
 Firestone Tire & Rubber Co., 1200 Firestone Pkwy., Akron 17, Ohio
 Firth Sterling Inc., 3113 Forbes Ave., Pittsburgh 30, Pa.
 Fisher & Ludlow Ltd., Mining Equip. Div., Bordesley Works, Birmingham 12, England
 Fischer & Porter Co., 215 Jacksonville Rd., Hatboro, Pa.
 Fisher Contracting Co., P.O. Box 6306, Phoenix, Ariz.
 Fisher Research Laboratory, Inc., 1975 University Ave., Palo Alto, Calif.
 Flake Brothers Refining Co., Lubriplate Div., 129 Lockwood St., Newark 5, N.J.
 Flexible Ducting Ltd., Maryhill, Glasgow, N.W. Scotland
 Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44, Ill.
 Flexible Tubing Corp., New Whitfield St., Guilford, Conn.
 Flexible Valve Corp., 400 Commercial Ave., Palisades Park, N.J.
FLOTTMAN-WERKE GMBH, HERNE, WESTF. STRASSE DES BOHRHAMMERS, WEST GERMANY
 Fluidrive Engr. Co., Ltd., Fluidrive Works, Isleworth, Middlesex, England
 Fluidwick Co., 5319 E. Outer Dr., Detroit 34, Mich.
 Fluor Products Co., Fluor-Hartmann Div., 12000 E. Washington Blvd., Whittier, Calif.
FLUOR PRODUCTS CO., SANTA FE TANK DIV., P.O. BOX 1267, SANTA ROSA, CALIF.
 Flygt Pumper GmbH, Georgstr. 35, Hannover, Germany
 Flygtz Popen N.V., Groothandelsgebouw, Weena 703, Rotterdam, Netherlands
FOOD MACHINERY & CHEM. CORP., JOHN BEAN DIV., P.O. BOX 145, 115 COLEMAN AVE., SAN JOSE 3, CALIF.
 Food Machinery & Chemical Corp., Peerless Pump Div., 301 West Avenue 26, Los Angeles, Calif.
 Ford Motor Co., Ford Division, P.O. Box 658, Dearborn, Mich.
 Foster Wheeler Corp., 666 Fifth Ave., New York 19, N.Y.
 Four Wheel Drive Corp., 12th Street, Clintonville, Wis.
 Foxboro Co., Foxboro, Mass.
S. G. FRANTZ CO. INC., P.O. BOX 1133, TRENTON 6, N.J.
FRASER & CHALMERS ENGR. WKS., GEN. ELECTRIC CO. LTD., FRASER RD., ERITH, KENT, ENGLAND
 Frederick, Francis H. & Associates, 690 Market St., San Francisco 4, Calif.
 Fruehauf Trailer Co., 10940 Harper Ave., Detroit 32, Mich.
FULLER MFG. CO., KALAMAZOO, MICH.

G

Galigher Co., 545 West 8th South St., P.O. Box 209, Salt Lake City 10, Utah
 Gallion Allsteel Body Co., S. Market St., Gallion, Ohio
 Gar Wood Industries, Inc., 36263 Michigan Avenue, Wayne, Mich.

Ralph Gardner & Co., 14112 Lima Rd., Ft. Wayne, Ind.
GARDNER-DENVER CO., FRONT ST., QUINCY, ILL.
 Garlock Packing Co., 402 Main Street, Palmyra, New York
GATES RUBBER CO., 999 S. BROADWAY, DENVER 17, COLO.
 Gatke Corp., 228 N. LaSalle St., Chicago 1, Illinois
 General-American Valve Co., 413 Poinsettia St., P.O. Box 444, Corona Del Mar, Calif.
 General Aniline & Film Corp., Ozalid Div., 100 Anso Road, Johnson City, N.Y.
GENERAL CABLE CORP., 730 THIRD AVE., NEW YORK 17, N.Y.
 General Dynamics Corp., Electro Dynamic Div., 163 Avenue A, Bayonne, New Jersey
 General Electric Co., Apparatus Sales Div., 1 River Rd., Schenectady 5, New York
 General Electric Co., Carbonyl Dept., Box 237, Roosevelt Park Place, Detroit 32, Mich.
 General Electric Co., Circuit Protective Devices Dept., 41 Woodford Ave., Plainville, Conn.
 General Electric Co., Wire & Cable Dept., Conduit Products Dept., 1255 Boston Ave., Bridgeport 2, Conn.
GENERAL ELECTRIC CO., INTERNATIONAL, 150 EAST 42ND ST., NEW YORK 17, N.Y.
 General Electric Co., Lamp Dept., Nela Park, E. Cleveland 12, Ohio
 General Electric Co., Metallurgical Products Dept., 11177 E. 8 Mile Rd., Detroit 32, Mich.
GENERAL ELECTRIC CO. OF ENGLAND, LTD., THE FRASER & CHALMERS ENG. WORKS, ERITH, KENT, ENGLAND AND MAGNET HOUSE, KINGSWAY, LONDON, W.C. 2
 General Equipment Co., Box 134, Owatonna, Minnesota
 General Fire Extinguisher Corp., 25631 Little Mack, St. Clair Shores, Mich., & 8740 Washington Blvd., Culver City, Calif.
 General Hardwood Co., Milwaukee Waterway at E. 11 St., Tacoma, Wash.
 General Machinery Co., 3500 Riverside Ave., Spokane, Wash.
 General Mills, Inc., Chemical Div., So. Kensington Rd., Kankakee, Ill.
 General Mills, Inc., Special Commodities Div., 9200 Wayzata Blvd., Minneapolis 26, Minn.
 General Motors Corp., Allison Div., P.O. Box 894, Indianapolis, Ind.
 General Motors Corp., Delco Products Div., 329 E. First St., Dayton, Ohio
 General Motors Corp., Detroit Diesel Engine Div., 13400 W. Otter Drive, Detroit 25, Mich.
 General Motors Corp., Electro-Motive Div., La Grange, Ill.
GENERAL MOTORS CORP., EUCLID DIV., 1361 CHARDON RD., CLEVELAND 17, OHIO
 General Motors Corp., GMC Truck & Coach Div., 660 S. Blvd., E. Pontiac 11, Mich.
 General Motors Corp., 269 N. Main St., New Departure Div., Bristol, Conn.
GENERAL MOTORS OVERSEAS OPERATION, 1775 BROADWAY, NEW YORK 19, N. Y.
 General Petroleum Corp., 612 S. Flower St., Los Angeles, Calif.
 General Refractories Co., 1520 Locust St., Philadelphia 2, Pa.
 General Tire & Rubber Co., Akron 1, Ohio
 Geo-Engr., 304 Main St., Grand Junction, Colo.
 Geo-Optic Co., Inc., 170 Broadway, New York 38, N.Y.
 Geophysical Services, Inc., 5900 Lemmon St., Dallas 9, Texas
 Geophysical Specialties Co., 15409 Robinwood Dr., Hopkins, Minn.
GETMAN BROS. MFG. DIV. INC., P.O. BOX 71, DUNKLEY AVE. SOUTH HAVEN, MICH.
 W. T. Glover & Co. Ltd., Trafford Park, Manchester 17, England
GODOY & CO. INC., E. A., CUNARD BLDG., 25 BROADWAY, NEW YORK 4, N.Y.
 Goodell Bros., Box 537, 46 S. Main St., Helena, Montana
GOODALL RUBBER CO., 430 WHITEHEAD ROAD, TRENTON, N.J.
 Goodman Mfg. Co., Halsted St. & 48th Pl., Chicago 9, Ill.
GOODRICH INDUSTRIAL PRODUCTS CO., E. 500 S. MAIN ST., AKRON, OHIO
GOODRICH CO. B. F. INTERNATIONAL INDUSTRIAL PROD. DIV., 500 S. MAIN ST., AKRON 18, OHIO
 Goodrich Tire Co., B.F., 500 S. Main St., Akron, Ohio
 Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, Ohio
GOODYEAR INTERNATIONAL CORP., 1144 E. MARKET ST., AKRON 16, OHIO
GOULD & CO., GORDON 1, 58 SUTTER ST., SAN FRANCISCO 4, CALIF.
 Gould-National Batteries, Inc., Trenton 7, New Jersey
 Granby Mining Co. Ltd., Allenby Foundry Div., Allenby, B.C. Canada
GRAYBAR ELECTRIC CO., INC., 425 LEXINGTON AVE., NEW YORK 17, N.Y.
 Great Lakes Carbon Corp., Mining & Mineral Prods. Div., 612 S. Flower St., Los Angeles 17, Calif.

Greensburg Div., National Mine Service Co., 102 Stanton St., Greensburg, Pa.
 Greenwood & Badley Ltd., Albion Works, Leeds, 12, England
 Grinnell Co., Inc., 280 West Exchange St., Providence, R. I.
 Gripsholt Inc., 424 Bryant St., S.F. 7, Calif.
 Gruendler Crusher & Pulverizer Co., 2918 N. Market St., St. Louis 6, Mo.
 Guest Keen Iron & Steel Co. Ltd., East Moors, Cardiff, U.K.
 Gundlach Machine Co., Div., T. J., J. M. J. Industries, Inc., 226 Centerville Ave., Belleville, Ill.
 Gurley, W. & L. E., 514 Fulton St., Troy, N.Y.
 Gustin Bacon Mfg. Co., 210 W. 10th St., Kansas City, Mo.
 Gutschhoffnungsbetriebe A.G., Oberhausen-Sterkrade, W. Germany

H

HACK ENGINEERING CO., 124 WAZEE MARKET, DENVER, COLO.
 Haddfield Ltd., East Hecla Works, Vulcan Rd., Tinsley, Sheffield 9, Yorkshire, England
 Halifax Tool Co., Ltd., West Lane, Southwram, Halifax, Yorkshire, England
 Hall & Neilson Ltd., Beaver Mills, East Garden St., Bury, Lancashire, England
 Halliburton Oil Well Cementing Co., Duncan, Oklahoma
 Hammond Bag & Paper Co., Wellsburg, W. Va.
 Hanson Corp., College & Pike, Canonsburg, Pa.
HANES, INC., ABBOTT A., 1390 SANSOME ST., SAN FRANCISCO 11, CALIF.
 Hanover Industries, Inc., 77 Veteran St., Meriden, Conn.
 Harbison-Walker Refractories Co., 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.
HARDINGE CO., INC., 240 ARCH ST., YORK, PA.
HARNISCHFEGGER CORP., 4400 NATIONAL AVE., MILWAUKEE 48, WIS.
HARNISCHFEGGER EXPORT CORP., SEE HARNISCHFEGGER CORP.
 Harnischfeger Int'l Corp., GmbH, Alleestrasse 33, Dusseldorf, Germany
 Harrison-Walker Refractories, 307-5th Ave., Pittsburgh 22, Pa.
 Hartmann, Maschinenfabrik AG, Waldstrasse 220 Offenbach-Main, Germany
 Hasenclever, Maschinenfabrik AG, Witzelstrasse 55, Dusseldorf, Germany
 Hausherr, Rudolf & Son, Maschinenfabrik, Alberfelderstrasse 53, Sprockhovel (Westf.), Germany
 Hawley & Hawley Assayer & Chemists, Inc., 537-21st St., Douglas, Ariz.
 Hawthorne, Herd J. Inc., P.O. Box 7366, Houston 8, Texas
 Haynes Stellite Co., Div. of Union Carbide Corp., 1020 W. Park Ave., Kokomo, Ind.
 Hayward Tyler & Co. Ltd., Luton, Beds, England
HAZEMAG OF GERMANY, P.O. BOX 576, MUNSTER (WESTFALLEN), GERMANY
HAZEMAG USA, INC., 122 E. 42ND ST., NEW YORK 17, N.Y.
 Head Wrighton Colliery Engr. Ltd., Mineral Engineering Div., 46, Rutland Park, Sheffield 10, England
HEAD WRIGHTSON STOCKTON FORGE LTD., NORTON ROAD, STOCKTON-ON-TEES, ENGLAND
 Heinriche Geoprospection Co., P.O. Box 5671, Tucson, Ariz.
 Hell Co., 3000 W. Montana St., Milwaukee 1, Wis.
 Hemscheidt, Hermann Maschinenfabrik, Bornberg 97-103, Wuppertal, W. Germany
 Hendrick Mfg. Co., Carbondale, Pa.
 Hercules Gallon Products, Inc., Gallon, Ohio
 Hercules Motors Corp., 101 East 11th St., S.E., Canton 2, Ohio
 Hercules Powder Co., 900 Market St., Wilmington 99, Del.
 Hercules Steel Products Co., Sherman St., Gallon, Ohio
HEWITT-ROBINS, 646 GLENBROOK RD., STAMFORD, CONN.
HEWITT-ROBINS INC., HEWITT RUBBER DIV., 240 KENSINGTON AVE., BUFFALO 5, N.Y.
 Heyl & Patterson, Inc., 55 Fort Pitt Blvd., Pittsburgh 22, Pa.
 Hirsch Bros. Machy. Co., P.O. Box 226, El Paso, Tex.
 Hitachi, Ltd., No. 4, 1-Chome, Marunouchi, Chiyoda-Ku, Tokyo, Japan
 Hobart Bros. Co., Hobart Sq., Troy, Ohio
 Hoffman Bros. Drilling Co., 120 E. Mahoning St., Punxsutawney, Pa.
 Holman Bros. (Canada) Ltd., Kent Ave., Kitchener, Ontario, Canada
HOLMAN BROS., LTD., CAMBORNE, CORNWALL, ENGLAND
 Holtzer-Cabot—see National Pneumatics Co., Inc.
 Homelite Div., Textron, Inc., Riverdale Ave., Port Chester, New York
 Homer Mfg. Div., The Ohio Electric Mfg. Co., 142 East Pearl St., Lima, Ohio

Hose Accessories Co., Le-Hi Div., 17th & Lehigh Ave., Philadelphia 32, Pa.
 Hose Accessories Co., Champ Industries Div., Lehigh Ave. & 17th St., Phila. 32, Pa.
 Hosfeld Mfg. Co., 460-462 West Third St., Winona, Minn.
HOSTACHEM CORP., (U.S. DISTRIBUTOR FOR KNAPSACK-GRIESHEIM, AG), 350 FIFTH AVE., SUITE 5211, NEW YORK 1, N.Y.
 Hough Co., The Frank G., 359 Sunnyside Ave., Libertyville, Ill.
 Moughton & Co., E. F., 303 W. Lehigh Ave., Philadelphia 33, Pa.
 Howe Scale Co., Inc., Rutland, Vermont
 Howell Electric Motors Co., 409 N. Roosevelt St., Howell, Mich.
 Huber Varco Co., 202 N. Greenwood St., Marion, Ohio
HUDSON LTD., ROBERT, RALETRUX HOUSE, MEADOWLANE, LEEDS 11, YORKS., ENGLAND
HUGHES TOOL CO., P.O. BOX 2339, HOUSTON 1, TEXAS
 Humphreys Engineering Co., 910 First National Bank Bldg., Denver 2, Colo.
 Hunslet Engine Co., Ltd., The—125, Jack Lane, Hunslet, Leeds 10, England
 Hunting Airborne Geophysics Ltd., 1450 O'Connor Dr., Toronto 16, Ontario, Canada
 Hunting Geophysical Services, Inc., 57 Park Ave., New York 17, N.Y.
 Hunting Technical & Exploration Services, Ltd., 57 Park Ave., New York 16, N.Y.
 Hunting Technical Services, Inc., 57 Park Ave., New York 16, N.Y.
 Huntington, Heberlein & Co., Ltd., Simon House, 28-29 Dover St., London, W.1, England
 Hycon Mfg. Co., 1030 S. Arroyo Parkway, Pasadena, Calif.
 Hydraulic Supply Mfg. Co., 7500 8th Ave. So., Seattle 5, Wash.
 Hyster Co., 2902 N.E. Clackamas St., Portland 8, Oregon

I

I. H. C. Holland, P. O. Box 6058, Gravenhage, Holland
 I-T-E Circuit Breaker Co., 1900 Hamilton St., Philadelphia 30, Pa.
 Ideal Corp., 495 Liberty Ave., Brooklyn 7, N.Y.
 Ideal Industries, Inc., 1055 Park Ave., Sycamore, Ill.
 Illinois Powder Mfg. Co., 506 Olive St., St. Louis, Mo.
 Imperial Chemical Industries, Ltd., Imperial Chem. House, Millbank, London, S.W.1, England
 Industrial Air Products Co., 3200 N.W. Yeon Ave., Portland 10, Oregon
 Industrial Coupler Co., P.O. Box 1751, E. 4218 Boone Ave., Spokane, Wash.
 Industrial Nucleonics Corp., 650 Ackerman Rd., Columbus 14, Ohio
INDUSTRIAL PHYSICS & ELECTRONICS CO., 479 S. 10TH E., SALT LAKE CITY 2, UTAH
 Inflico, Inc., 9015 Campbell Ave., P.O. Box 5033, Tucson, Ariz.
 Ingersoll, Guy E., 5505 Timberwolf Drive, El Paso, Texas
INGERSOLL-RAND CO., 11 BROADWAY, NEW YORK 4, N.Y.
 Ingersoll-Rand Co. Ltd., 165, Queen Victoria St., London, E.C. 4, England
INSPIRATION CONSOLIDATED COPPER CO., SEE ORE BUYER'S SECTION
INTERNATIONAL B. F. GOODRICH, 500 SOUTH MAIN ST., AKRON 18, OHIO
 International Combustion Ltd., 19 Woburn Place, London W.C. 1, England
 International Geophysics, Inc., 2500 West Coast Hwy., Newport, Calif.
INTERNAT'L HARVESTER EXPORT CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.
INTERNAT'L HARVESTER EXPORT CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.
 International Minerals & Metals Corp., 11 Broadway, New York 4, N.Y.—See Ore Buyers Guide, Pg. 139.
 International Nickel Co., Inc., 67 Wall St., New York 5, N.Y.
 Internat'l Smelting & Refining Co., 818 Kearns Bldg., Salt Lake City, Utah
 Interstate Equip. Co., 433 N. Broad St., Elizabeth, New Jersey
 Iowa Mfg. Co., Cedar Rapids, Iowa
 Irwin—Sensenich Corp., P.O. Box 311, Irwin, Pa.
 Isbell Construction Co., P.O. Box 2351, Reno, Nevada

J

Jaeger Machine Co., 550 W. Spring St., Columbus, Ohio
 Jeffrey Mfg. Co., 861 N. 4th St., Columbus 16, Ohio

Jet-Lube, Inc., 2093 No. California St., Burbank, Calif.
 John Deere Industrial Division, 3300 River Drive, Moline, Ill.
 Johns-Manville Sales Corp., 22 East 40th St., New York 16, N.Y.
 Johnson, Herbert Banks, 804 Franklin St., Clearwater, Fla.
 Johnson-March Corp., 3018 Market St., Philadelphia 4, Pa.
 Johnston Pump Co., 3272 E. Foothill, Pasadena, Calif.
 Jones & Laughlin Steel Corp., 8 Gateway Center, Pittsburgh 30, Pa.
 Joost Mfg. Co., 742 Bancroft Way, Berkeley 10, Calif.
JOY MFG. CO., HENRY W. OLIVER BLDG., PITTSBURGH 22, PA.
 Joy Sullivan Ltd., Cappelow, Greenock, Scotland
 Junction Bit & Tool Co., P.O. Box 1951, Grand Junction, Colo.

K

KW-Dart Truck Co., 1301 N. Manchester, Kansas City 41, Mo.
 Kaelble, Carl GmbH, Backnang Nr. Stuttgart, W. Germany
 Kaiser Aluminum & Chem. Corp., Refractories & Chem. Div., 300 Lakeside Drive, Oakland 12, Calif.
 Kaiser Engineers, 300 Lakeside Drive, Oakland 12, Calif.
 Kaiser Steel Corp., Kaiser Center, 300 Lakeside Drive, Oakland 12, Calif.
 Ka-Mo Tools, Inc., 1845 So. 55 Ave., Cicero 50, Ill.
 Kansas City Hay Press Co., 801 Woodswether Rd., Kansas City 5, Mo.
KEENEY, PAUL E. CO., 1125 S. E. GRAND AVE., PORTLAND 14, ORE.
KELLOGG EXPLORATION CO., 3301 N. MARENGO AVE., ALTADENA, CALIFORNIA
 Kellogg, M. W., Co., 711 3rd Ave., New York 17, N.Y.
 KEMA (Kohn-Ehrenfelder Maschinenbau-Anstalt GmbH) Vogelsangerstr. 250, Kohn-Ehrenfeld, Germany
KENNAMETAL INC., MININGTOOL DIV., BEDFORD, PA.
 Kennedy-Van Saun Mfg. & Eng. Corp., 405 Park Ave., New York 22, N.Y.
 Kern Instrumts. Inc., 120 Grand St., White Plains, N.Y.
 Keuffel & Esser Co., 306 Adams St., Hoboken, N.J.
 Keystone Lubricating Co., 21st & Lippincott Sts., Philadelphia 32, Pa.
 Kilde, Walter & Co., Inc., 456 Main St., Belleville 3, N.J.
KLOCKNER-HUMBOLDT-DEUTZ AG. WERK HUMBOLDT, KOLN, KALK, GERMANY—SEE DIESEL ENERGY CORP.
 Knapp & Bates, Ltd., 14-17 Finsbury Court, Finsbury Pavement, London E.C. 2, England
KNAPSACK-GRIESHEIM A.G. (SEE FARBWERKE HOESCHT)
 Koebel Diamond Tool Co., 9456 Grinnell Ave., Detroit 13, Mich.
 Koehring Co., 3028 West Concordia Ave., Milwaukee 16, Wis.
 Kohler Co., Kohler, Wis.
 Koppers Co., Wood Pres. Div., 750 Koppers Bldg., Pittsburgh 19, Pa.
 Koppers Co., Inc., Wolman Dept., 700 Koppers Bldg., Pittsburgh 19, Pa.
KRALOY PLASTIC PIPE CO., INC., P.O. BOX 1950 SANTA ANA, CALIF.
KRUPP, FRIED. MASCHINEN UN STAHLBAU, RHEINHAUSEN, W. GERMANY
 Kwik-Mix Co., Div. of Koehring Co., 235 W. Grand Ave., Port Washington, Wisc.

L

L&M RADIATOR SERVICE, 2401 FIRST AVE., HIBBING, MINN.
 LaBour Co., 1607 Sterling Ave., Elkhart, Ind.
LAKE SHORE INC. LAKE SHORE ENG. DIV., BOX 911, IRON MTN., MICH.
 Lancashire Dynamo & Crypto Ltd., Trafford Park, Manchester 17, England
 Landa Steel Co., Box 248, 116 West A St., Picher, Okla.
LANDSVERK AB. LANDSKRONA, SWEDEN
 LaRoe Instruments Inc., 1709 B Rockville Pike, Rockville, Maryland
 Laughlin Co., Thomas, 143 Fore St., Portland 6, Maine
 Lead Lined Iron Pipe Co., 33 Broadway, Wakefield, Mass.
LECTROMELT FURNACE DIV. MCGRAW EDISON CO., P.O. BOX 1257, PITTSBURGH, PA.
 Leden Mfg. Co. Div. of Leden Inc., 3350 N. Gilman Rd., El Monte, Calif.
 Ledoux & Co., 359 Alfred Ave., Teaneck, N.J.

Leeds & Northrup Co., 4901 Stenton Ave., Phila. 44, Pa.
 Lee Rubber & Tire Corp., Republic Rubber Div., 1410 Albert St., Youngstown, Ohio
 LeGrand Sulfuric & Gell Ltd., The Green, Southall, Middlesex, England
 Lehigh Safety Shoe Co., First & Minor Sts., Emmaus, Pa.
 Le Roi Div., Westinghouse Airbrake Co., 3716 W. Wisconsin Ave., Milwaukee, Wis.
 Leschen Wire Rope Div., H. K. Porter Co., 2727 Hamilton Ave., St. Louis 12, Mo.
 LETOURNEAU-WESTINGHOUSE CO., 2391 N. ADAMS ST., PEORIA, ILL.
 LIBU SHOVEL CO. AB. STUREVAGEN 18, STOCKHOLM, SWEDEN (SUBSID. IN ENGLAND: LIBU SHOVEL CO. LTD., AMERSHAM COMMON, BUCKS, ENGLAND)
 Lima Electric Motor Co., Findlay Road, Lima, Ohio
 LINATEX CORP. OF AMERICA, VERNON AVE., ROCKVILLE, CONNECTICUT
 Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, Ohio
 Lincoln Engr. Co., Div. McNeil Machine & Engr. Co., 4010 Goodfellow Blvd., St. Louis 20, Mo.
 Lindqvist & Cie, 32 Avenue de l'Opera, Paris, France
 Linde Co., Div. Union Carbide Corp., 30 E. 42nd St., New York 17, N.Y.
 Link-Belt Co., Dept. 59-WML, 233 Broadway, New York 7, N.Y.
 Link-Belt Co., Prudential Plaza, Dept. WMD-57, Chicago, Ill.
 Link-Belt Speeder Corp., 1201 Sixth St., S.W., Cedar Rapids, Iowa
 Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.
 Liquid-Solid Separations Ltd., 2 Anderson St., London, S.W.3, England
 Livingston & Wilson Exploration & Drilling Co., P.O. Box 519, Longmont, Colo.
 Loesch Harsco Engineering-Zementmaschinen K.G., Steinstrasse 18—Dusseldorf, W. Germany
 Locomotive Crane Div., McDowell Co., Inc., The
 LOGAN ENGR. CO., 4901 LAWRENCE AVE., CHICAGO 30, ILL.
 LONGYEAR CO., E. J., 74 SO. 8TH ST., MINNEAPOLIS 2, MINN.
 Loofbourow, R. L., 4032 Queen Ave. So., Minneapolis 10, Minn.
 Los Angeles Scientific Instrument Co., 2451 Riverside Drive, Los Angeles 39, California
 LOTT RIDGE-THOMAS & ASSOC., 905 JUDGE BUILDING, SALT LAKE CITY 11, UTAH
 Ludlow-Saylor Wire Cloth Co., 634 South Newstead Ave., St. Louis 10, Mo.
 Lufkin Rule Co., 1730 Hess St., Saginaw, Mich.
 Lug-All Co., 355 E. Lancaster, Haverford, Pa.
 Lundberg Exploration, Ltd., 86 Eglinton Ave. E., Toronto 12, Ontario, Canada
 LURGI-GES. F. CHEMI & HERTTENWESSEN M.B.H., LURGHHAUS, GURVINUSSTRASSE, FRANKFURT MAIN, GERMANY

M

M-R-S. Mfg. Co., Flora, Miss.
 MACAFEE & CO., 3105 WILSHIRE BLVD., LOS ANGELES 5, CALIF.
 MACE CO., THE, 2743 BLAKE ST., DENVER 5, COLO.
 MACHINERY CENTER INC., P.O. BOX 964, SALT LAKE CITY, UTAH
 MACK TRUCKS, INC., EMPIRE STATE BLDG., NEW YORK 1, N.Y.
 MacWhyte Wire Rope Co., 2998-14th Ave., Kenosha, Wis.
 MAGMA COPPER CO., SUPERIOR, ARIZONA
 Magnetic Engineering & Mfg. Co., 851 Van Houten Ave., Clifton, N.J.
 Major Car Corp., 50 Church St., New York 7, N.Y.
 Mancha Storage Battery Locomotive Div., Goodman Mfg. Co., Halsted & 48th Pl., Chicago 9, Ill.
 Manitowoc Engineering Corp., South 16th St., Manitowoc, Wis.
 Mannesmann Export G.m.b.H., Thomasstrasse 8, Dusseldorf, Germany
 MARION POWER SHOVEL CO., P.O. BOX 505, MARION, OHIO
 Marmon-Herrington Co., Inc., 1511 W. Washington St., Indianapolis 7, Ind.
 Martindale Electric Co., 1392 Hird Ave., Cleveland 7, Ohio
 Maschinenfabrik Augsburg-Nurnberg AG, (M.A.N.) Nurnberg, West Germany
 Matheson, Coleman & Bell, Div. The Matheson Co., Inc., 2909 Highland Ave., Norwood 12, Ohio
 Mayhew Supply Co., 4700 Scyene Rd., P.O. Box 7726, Dallas, Texas
 Mayo Tunnel & Mine Equip., Box 1413, Lancaster, Pa.
 McCauley Industrial Corp., 1840 Howell Ave., Dayton, Ohio
 R. S. MCCLINTOCK CO., P.O. BOX 66, W. 418 2ND AVE., SPOKANE 16, WASH.
 McDonald Drilling Co., 14408 St. Marys, Detroit 27, Mich.

McDowell Co., Inc., The Wellman Engineering Co., 113 St. Clair Ave. N.E., Cleveland 14, Ohio
 McGraw-Edison Co., Thomas A. Edison Industries, Storage Battery Div., West Orange, N.J.
 McKennie & Whittle Cont., P.O. Box 5602, Dallas, Texas
 MCLEANAHAN & STONE CORP., HOLLI-DAYSBURG, PA.
 McNally Pittsburgh Mfg. Corp., Drawer D, 307 W. 3rd St., Pittsburgh, Kansas
 Menlo Research Lab., Box 622, Menlo Park, Calif.
 Merrick Scale Mfg. Co., 180 Autumn St., Passaic, N.J.
 MESABI ENGINEERING, NEW YORK BLDG., ST. PAUL 1, MINN.
 Metal Carbides Corp., 6001 Southern Blvd., Youngstown, Ohio
 Metron Instrument Co., 432 Lincoln St., Denver, Colo.
 Mexico Refractories Co., Coal & Love Sts., Mexico, Mo.
 Micro Switch, div. of Minneapolis-Honeywell Regulator Co., Chicago & Spring Sts., Freeport, Ill.
 Mill & Mine Supply, Inc., 505 Lander St., Seattle 4, Wash.
 Mills Iron Works, Inc., 929 North Main St., Los Angeles 12, Calif.
 Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa.
 MINE & SMELTER SUPPLY CO., MANUFACTURING DIV., 3800 RACE ST., DENVER, COLO.
 Minerais Et Metaux, Societe Anonyme, 28 Rue Arthur Rossier, Paris XIX, France
 Minerec Corp., 120 Broadway, New York, N.Y.
 Minerals Engineering Co., 801 4th Ave., Grand Junction, Colo.
 Miners Foundry & Mfg. Co., 200 Spring St., Nevada City, Calif.
 Mining & Geophysical Services, Ltd., 123 Victoria St., London S.W.1, England
 MINING ENGINEERING CO. LTD., THE, MECO WORKS, WORCESTER, ENGLAND
 Minneapolis-Honeywell, Heiland Div., 130 E. 5th Ave., Denver 3, Colo.
 Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Avenues, Philadelphia 44, Pa.
 Minneapolis-Honeywell Regulator Co., Micro Switch Div., Freeport, Ill.
 Minneapolis-Moline Co., P.O. Box 1050, Minneapolis 1, Minn.
 Minnesota Mng. & Mfg. Co., Irvington Var-nish & Insulator Div., 8 Argyle Terrace, Irvington 11, N.Y.
 MIRRLEES, BICKERTON & DAY LTD., MIRRLEES WORKS, HAZEL GROVE, STOCKPORT, CHESHIRE, ENGLAND
 Mitchell, Miles J., 10 Santa Margarita Dr., San Rafael, Calif.
 Mitchell Ropeways Ltd., Mitro House Burghley Rd., Peterborough, Northants, England
 Mixermobile Mfg. Inc., 8027 N.E. Killingsworth, Portland 20, Ore.
 Moab Drilling Co., 62 E. Center St., Box 487, Moab, Utah
 Mobile Drilling, Inc., 960 North Pennsylvania St., Indianapolis 4, Ind.
 Mono Pumps Ltd., Mono House, Sekforde St., London E.C., England
 Monsanto Chemical Co., 1700 S. Second St., St. Louis 4, Mo.
 Morgardshammers Mek. Verkstads AB, Morgardshammer, Sweden
 Morris Machine Works, Baldwinville, N.Y.
 Morse Bros. Machinery Co., 2900 Brighton Blvd., Denver, Colo.
 Morse Chain Co., Borg-Warner Industry, S. Aurora St., Ithaca, N.Y.
 Motor Rail, Ltd., Simplex Works, Bedford, England
 MOTORAMIC INC., 2120 MARKET ST., SAN FRANCISCO 14, CALIF. SUBSID. OF SVENSKA MOTORBORR A.B.
 Motorola Communications & Electronics, Inc., 4501 W. Augusta Blvd., Chicago 51, Ill.

N

NAGLE PUMPS, INC., 1250 CENTER AVE., CHICAGO HEIGHTS, ILL.
 Napco Industries Inc., 534 N. Seventh St., Minneapolis 11, Minn.
 National Carbon Co., 60 E. 42nd St., N.Y. 17, N.Y.
 National Filter Media Corp., 1717 Dixwell Ave., New Haven 14, Conn.
 National Fuse & Powder Co., 3801 Delany St., Denver 5, Colorado
 NATIONAL IRON CO., 50TH AVE. & RAMEY ST., DULUTH 7, MINN.
 NATIONAL MALLEABLE & STEEL CASTINGS CO., 16600 QUINCY AVE., CLEVELAND 6, OHIO
 NATIONAL MALLEABLE & STEEL CASTINGS CO., CAPITOL FOUNDRY DIV., PHOENIX, ARIZ.
 NATIONAL MINE SERVICE CO., 2530 KOPPERS BLDG., PITTSBURGH 19, PENNSYLVANIA
 National Supply Co., 2 Gateway Center, Pittsburgh 22, Pa.
 National Tank & Pipe Co., 2301 N. Columbia Blvd., Portland 17, Ore.

National Tank & Pipe Dept., Simpson Engineered Wood Products Co., 2301 N. Columbia Blvd., Portland 17, Ore.
 NAYLOR PIPE CO., 1242 E. 92ND ST., CHICAGO 19, ILL.
 New York Air Brake Co., The, Aurora Pump Div., 619 Loucks St., Aurora, Ill.
 Newport Industries Co., Div. of Heyden-Newport Chemical Corp., 342 Madison Ave., New York 17, N.Y.
 Newton, Chambers & Co., Ltd., Thorncliffe Nr. Sheffield, England
 Nichols Engineering & Research Corp., 70 Pine St., New York 5, N.Y.
 Nolan Co., Bowerston, Ohio
 NORDBERG MFG. CO., 3073 S. CHASE AVE., MILWAUKEE 1, WIS.
 North American Refractories Co., 1012 Nat'l City-E 6th St. Bldg., Cleveland 14, Ohio
 North British Locomotive Co. Ltd., 110 Fleming St., Springburn, Glasgow, N. I., Scotland
 NORTHERN BLOWER CO., 6429 BARBERTON AVE., CLEVELAND 2, OHIO
 Northwest Engr. Co., 135 S. LaSalle St., Chicago 3, Ill.
 Norton Co., 1 New Bond St., Worcester 6, Mass.
 Norwood Controls Unit, Detroit Controls Div. of American Standard, 934 Washington St., Norwood, Mass.
 Nuclear-Chicago Corp., 333 E. Howard Avenue, Des Plaines, Illinois
 Nuclear Corp. of America, 2 Richwood Place, Denville, N.J.
 Nucletic Corp. of America, 196 Degraw St., Brooklyn 51, N.Y.

O

Ogden Iron Works Co., Box 147, 185 26rd St., Ogden, Utah
 Ohio Brass Co., 280 North Main St., Mansfield, Ohio
 Ohio Carbon Co., 12508 Berea Rd., Cleveland 11, Ohio
 Ohio Hoist Mfg. Co., 321 S. Beaver St., Lisbon, Ohio
 Oil Tool Mfg. Co., Box 24, Tonkawa, Okla.
 Okonite Co., Hazard Insulated Wire Works Div., 220 Passaic St., Passaic, N.J.
 Oldham & Son, Ltd., Denton, Manchester, England
 Olin Mathieson Chem. Corp., Explosives Div., East Alton, Ill.
 Oliver Corp., 400 W. Madison St., Chicago 6, Ill.
 Oliver Corp., A. B. Farquhar Div., 142 N. Duke St., York, Pa.
 Onan Sons, Inc., D. W., 2615 University Ave., S.E., Minneapolis 14, Minn.
 Ore & Chemical Co., 80 Broad St., New York 4, N.Y.
 Ortrac, Inc., 320 South Grand St., St. Louis 3, Mo.
 Orenstein-Koppel und Lubecker Maschinenbau AG, Postfach 270, Lubeck, Germany
 Osborne Lab. Inc., Raymond G., 235 W. 27th, Los Angeles 7, Calif.
 Osmose Wood Preserving Co. of America Inc., 980 Ellicott St., Buffalo 9, N.Y.
 Overstrom & Sons, 2213 W. Mission Rd., Alhambra, Calif.
 Oxy-Catalyst, Inc., Devon, Pa.

P

Pacific Car & Foundry Co., 4th & Factory, Renton, Wash.
 Pacific Foundry & Metallurgical Co., 3100 19th St., San Francisco
 PACIFIC PIPE CO., 461 FOLSOM ST., SAN FRANCISCO, CALIF.
 Pacific Wire Rope Co., 1840 E. 15th St., Los Angeles 21, Calif.
 Page Engineering Co., Clearing Post Office, Chicago 38, Ill.
 Parker Ltd., Frederick, Viaduct Works, Leicester Leicestershire, England
 Parker Safety Equip. Co., 785 Lyons Ave., Irvington 11, N.J.
 Peale, Rogers, 315 Montgomery St., San Francisco, Calif.
 Peebles & Co. Ltd., Bruce, Engineers, East Pitton, Edinburgh 5, Scotland
 Peerless Pump Div., Food Machinery & Chemical Corp., 301 W. Ave. 26, Los Angeles 21, Calif.
 Peppson, Ltd., Coalville, Leicestershire, England
 Pendleton Woolen Mills, Washougal Branch, P.O. Box 656, Washougal, Wash.
 Pennsalt Chemicals Corp., 3 Penn Center, Philadelphia 2, Pa.
 PENNSALT OF WASHINGTON, DIV. PENN-SALT CHEM. CORP., 2901 TAYLOR WAY, TACOMA 2, WASH.
 Pennsylvania Crusher Div., Bath Iron Works Corp., 323 S. Matlack St., West Chester, Pa.
 Pennsylvania Drilling Co., 1205 Chartiers Ave., Pittsburgh 20, Pa.
 Perkins Engines Ltd., Peterborough, England
 Perkin Ltd., Baker, Westwood Works, Peterborough, England

Permutit Co., The, A Div. of Pfaunder Permutit, Inc., 50 W. 44th St., New York, N.Y.

PETERSON FILTERS & ENGR. CO., 1949 50. 2ND WEST, P.O. BOX 606, SALT LAKE CITY 16, UTAH

Pettibone Mulliken Corp., 4710 W. Division St., Chicago 51, Ill.

Phelps Dodge Refining Corp., 300 Park Ave., New York 22, N.Y.

Phelps Dodge Copper Prod. Corp., 300 Park Ave., New York, N.Y.

Philadelphia Gear Works, Inc., G-St. below Erie Ave. & G. St., Philadelphia 34, Pa.

Philadelphia Quartz Corp., 11461 Public Ledger Bldg., Philadelphia 6, Pa.

Piggott Projects, 1057 Howard St., San Francisco, Calif.

Philips Electronics, Inc., a Div. of Philips Electronics & Pharmaceutical Industries Corp., 750 S. Fulton Ave., Mt. Vernon, N.Y.

Pierce, Roger V., 808 Newhouse Bldg., Salt Lake City 4, Utah

Pioneer Engineering Div., Poor & Co., Inc., 3200 Como Ave., S.E., Minneapolis, Minn.

Pitman Manufacturing Co., Garner Ave. & Duck Rd., Grandview, Mo.

Plymouth Locomotive Works, Div. of the Fateroot-Heath Co., Plymouth, Ohio

Pleuger Unterwasserpumpen GmbH, Hamburg-Wandbek, Friedric-Ebert-Damm 105 Germany

Pollard Bearings Ltd., Ferrybridge, Knottingley, Yorkshire, England

H. K. Porter Inc., 74 Foley St., Somerville 43, Mass.

Porter Co., Inc., H. K. Leschen Wire Rope Div., 2727 Hamilton Ave., St. Louis, Mo.

Porter Co., Inc., H. K. Quaker Rubber Div., Tacony & Comly Streets, Philadelphia, Pa.

H. K. Porter Co. Inc., Thermoid Div., Whitehead Rd., Trenton 6, N.J.

Post Co., Frederick, 158 E. Ohio, Chicago, Ill.

Powermite Drill & Tool Co., P.O. Box 1121, Ontario, Calif.

Precision Radiation Instruments Inc., 4223 W. Jefferson Blvd., Los Angeles 16, Calif.

Price, Franklin L. C., 1105 Northern Life Tower, Seattle 1, Wash.

Priestman Brothers Ltd., Holderness Engr. Works, Hedon Road, Hull, England

Princeton Grapichol, Inc., 32 George St., Boston 19, Mass.

Productive Equipment Corp., 2926 W. Lake St., Chicago 12, Ill.

Pulmosan Safety Equip. Corp., 644 Pacific St., Brooklyn 17, N.Y.

Pulva Corp., 659 High St., Perth Amboy, N.J.

Pyrrometer Instrument Co., Inc., 92 Portland Ave., Bergenfield, N.J.

Q

Quaker Pioneer Rubber Mills, 520 Fourth St., San Francisco, Calif.

Quaker Rubber Div., H. K. Porter Co., Tacony & Comly Sts., Philadelphia 24, Pa.

Quick-Way Truck Shovel Co., 2401 E. 40th Ave., Box 1800, Denver, Colo.

R

Radac Co., Inc., 489 5th Ave., New York 17, N.Y.

Rankin Mfg. Co., 616 S. Marengo Ave., Alhambra, Calif.

Rapid Magnetic Machines, Ltd., Lombard St., Birmingham 12, England

Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N.J.

Ray-O-Vac Co., Div. of Electric Storage Battery Co., 212 E. Washington Ave., Madison 10, Wis.

Ray-O-Vac Co., Willson Products Div., 2nd & Washington St., Reading, Pa.

REED ENGINEERING CO., 630 SO. INGLEWOOD AVE., INGLEWOOD, CALIF.

Reeves Pulley Co., 1225-7th St., Columbus, Ind.

REICHDRIILL DIV., CHICAGO PNEUMATIC TOOL CO., 1439 ASH ST., TERRE HAUTE, IND.

Reichdrill Mfg. Co. Ltd., Coltness, Newmains, Wishaw, Lanarkshire, Scotland

Reilly Tar & Chemical Corp., 1615 Merchants Bank Building, Indianapolis 4, Ind.

Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17, Ohio

Remington Arms Co., Inc., 939 Barnum Ave., Bridgeport, Conn.

Republic Rubber Div., Lee Rubber & Tire Corp., Albert St., Youngstown 1, Ohio

Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio

Republic Steel Corp., Bolt & Chain Div., 1970 Carter Rd., Cleveland, Ohio

Republic Steel Corp., Truscon Steel Div., Albert St., Youngstown 1, Ohio

Research Cottrell, Inc., P.O. Box 750, Bound Brook, N.J.

Remisto-Loy Co., Inc., 1251 Phillips Ave., S.W., Grand Rapids 7, Mich.

Revere Copper & Brass Inc., 230 Park Ave., New York 17, N.Y.

Revere Electric Mfg. Co., 7420 Lehigh Ave., Chicago 48, Ill.

RIBLET TRAMWAY CO., N. 1231 WASHINGTON ST., SPOKANE, WASH.

Richardson Scale Co., 688 Van Houten Ave., Clifton, N.J.

Rick Helicopters, Inc., San Francisco International Airport, San Francisco 28, Calif.

Ridge Tool Co., 400 Clark St., Elyria, Ohio

Rip-Bits, Ltd., Calliwhite Lane, Dronfield, Sheffield, England

Robbins & Myers, Inc., 1345 Legonda Ave., Springfield, Ohio

Roberts & Schaefer Co., 180 N. Wells St., Chicago 6, Ill.

Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.

Rodale Mfg. Co. Inc., 6th & Minor Sts., Emmaus, Pa.

ROEBLING'S SONS, John A., DIV. OF COLORADO FUEL & IRON CORP., 640 S. BROAD ST., TRENTON 2, N.J.

Rogers Iron Works Co., 11th & Pearl St., Joplin, Mo.

Rohm & Haas Co., Washington Square, Philadelphia 5, Pa.

ROLLS-ROYCE LTD., SHREWSBURY, ENGLAND

Rome Cable Corp., Division of Alcoa, Ridge 56, P.O. Box 7, Rome, N.Y.

Roots-Connersville Blower Div., Dresser Industries, 900 West Mount St., Connersville, Indiana

Ropeways Ltd., 62 London Wall, London E.C. 2, England

Rose Mfg. Co., 2700 West Barberry Place, Denver, Colo.

Ross Screen & Feeder Co., 100 Quimby St., Westfield, N.J.

Rothe Erde Eisenwerk G.m.b.H., Dortmund, Germany

Round Chain Co.'s, Broadway & Chincraft Rd., Cleveland 5, Ohio

Rubber Improvement Ltd., Rilex House, 2, Chandos St., London W. 1, England

Ruhrkuststoff G.m.b.H., Mulheim-Ruhr, West Germany

Ruston-Bucyrus Ltd., P.O. Box 14, Excavator Works, Lincoln, England

Ruston & Hornsby Ltd., Lincoln, England

Ruth Co., The, 1437 Blake St., Denver 2, Colo.

Ryerson, Joseph T. & Son, Inc., 16th & Rockwell St., Chicago 8, Ill.

Rylands Brothers Ltd., Warrington, Lancashire, England

S

Safety First Supply Co., 425 Magee St., Pittsburgh 19, Pa.

Safety Products Ltd., Holmethorpe Ave., Redhill, Surrey, England

Salem Tool Co., 767 S. Ellsworth Ave., Salem, Ohio

SALZGITTER MASCHINEN AG SALZGITTERBAD, GERMANY

Sanford-Day Iron Works, Inc., 610 Dale Ave., Box 1511, Knoxville, Tenn.

SAUERMAN BROS., INC., 638 S. 25TH AVE., BELLWOOD, ILL.

Schaefer & Associates, P. C., P.O. Box 54, Parral, Chihuahua, Mexico

Schaeffer Foidometer Co., 2825 Smallman St., Pittsburgh 22, Pa.

Scharf, Heinrich G.m.b.H., Hamm (Westfalia) Germany

Scheidenhelm, F. W., 50 Church St., New York 7, N.Y.

Schied Bantam Co., Park St., Waverly, Iowa

Schramm Inc., West Chester, Pa.

Schroter & Lockwood, 3515 Sunset Blvd., Los Angeles 26, Calif.

Scientific Instrument Company

Scott's Concentrators, P.O. Box 211, Fair Oaks, Calif.

Screen Equip. Co., Inc., Buffalo 25, N.Y.

Security Engineering Div., Dresser operations, Inc., P.O. Box 16347, Dallas, Texas

Sepor Microsplitter Supply, 1846 S. Oak Park Ave., Berwyn, Illinois

Service Supply Corp., 29th & Erie Ave., Philadelphia 32, Pa.

Shaft & Devel. Mach. Co., 305 Newhouse Bldg., Salt Lake City, Utah

Sharples Chemicals Inc., 1100 Widener Bldg., Philadelphia 7, Pa.

Sheepbridge Equipment Ltd., Sheepbridge Works, Chesterfield, Derbyshire, England

SHEFFIELD STEEL DIV., ARMCO STEEL CORP., SHEFFIELD STATION, KANSAS CITY 25, MO.

Shell Oil Co., 100 Bush St., San Francisco 6, Calif.

Shepard Niles Crane & Hoist Corp., Schuyler, Montour Falls, N.Y.

Sheppard Co., R. H., 101 Philadelphia St., Hanover, Pa.

Siemens & Halske AG, 50 Werner-Von-Siemensstr. Erlangen, W. Germany

Silver Engineering Works, Inc., 3309 Blake St., Denver, Colo.

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

Simplicity Engineering Co., 209 South Oak St., Durand, Mich.

Sintered Products Ltd., Sutton-in-Ashfield, England

SKF Hellefors Jernverk, Hellefors, Sweden

SKF Industries, Inc., Front St. & Erie Ave., P.O. Box 6731, Philadelphia 32, Pa.

SKINNINGROVE IRON CO. LTD., P.O. BOX NO. 1, SALT BURN-BY-THE-SEA, YORKS, ENGLAND

SKOOKUM CO., INC., 5504 N. CRAWFORD ST., PORTLAND 3, ORE.

Sloan & Associates, Inc., Photogrammetric Engineers, 51 E. Foothill Blvd., Arcadia, Calif.

SMITH & CO., F. L., 11 WEST 43 ST., NEW YORK 36, N.Y.

SMIT & CO. INC., ANTON, 11 EIGHTH AVE., NEW YORK 11, N.Y.

Smit & Sons, Inc., J. E., Murray Hill, New Jersey

Smit & Sons (Diamond Tools) Ltd., J. K., 22-24 Ely Place, Holborn Circus, London E.C. 1, England

Smith-Blair, Inc., 535 Railroad Ave., So. San Francisco, Calif.

Smith-Emery Co., 781 East Washington Blvd., Los Angeles 21, Calif.

Smith & Sons (Rodley) Ltd., Thos., Rodley, Leeds, England

Smith Engineering Works, 532 E. Capitol Drive, Milwaukee 12, Wis.

Socony-Vacuum Oil Co., 26 Broadway, New York 4, N.Y.

Solar Aircraft Co., 2200 Pacific Hwy., San Diego 12, Calif.

Southern Spectrographic Laboratory, Box 6014, Dept. B, Dallas 22, Texas

SOUTHWESTERN ENGINEERING CO., 4800 SANTA FE AVE., LOS ANGELES 58, CALIF.

SPANG & CO., ETNA ST., P.O. BOX 751, BUTLER, PA.

Spencer Chemical Co., 610 Dwight Bldg., Kansas City, Mo.

Spencer Turbine Co., 486 New Park Ave., Hartford 6, Conn.

SPRAGUE & MENWOOD, INC., BOX 446, SCRANTON 2, PA.

Stahlwerke Brunninghaus G.m.b.H., Hagenstr. 4, Westhofen (Westf.) Germany

Stahlwerke Sudwestfalen AG, Brunninghaus, Westhofen W. Germany

STANCO MFGS. & SALES, INC., 1666 NINTH STREET (COR. OLYMPIC BLVD.) SANTA MONICA, CALIF.

Standard Electric Mfg. Co., Inc., Haddon Ave., West Berlin, N.J.

Standard Filterbau Ges. m.b.H., Lodenheide 8, Munster Westf., W. Germany

Standard Oil Co. of Calif. Western Operations, Inc., 225 Bush St., San Francisco, Calif.

Standard Oil Company (Indiana), 910 So. Michigan, Chicago, Ill.

STANDARD STEEL CORP., P.O. BOX 58252, 5021 BOYLE AVE., LOS ANGELES 54, CALIF.

Stanton & Son Inc., E. J., P.O. Box 3816 Terminal Annex, Los Angeles 54, Calif.

Staplex Co., The Air Sampler Div., 777 Fifth Ave., Brooklyn 32, N.Y.

Star Expansion Pacific, Inc., 142 Liberty St., N.Y. 6, N.Y.

Star Wire Screen & Iron Works, Inc., 2515 San Fernando Road, Los Angeles 65, Calif.

Stauffer Chemical Co., Consolidated Chemical Industries Div., 636 California St., San Francisco 8, Calif., and 6910 Fannin St., Houston 25, Texas

Stearns Magnetic Products, 685 S. 28th St., Milwaukee 46, Wis.

STEARNS ROGER MFG. CO., P.O. BOX 5370, DENVER, COLO.

Steel Props & Mining Equipment Ltd., 61 Pall Mall, London S.W. 1, England

John G. Stein & Co. Ltd., Bonnybridge, Scotland

Stenberg Corp., AB, Duvedsvagen 17, Stockholm-Zallaby, Sweden

Stenberg Corp. of Canada Ltd., 8230 Mayrand St., Montreal 9, Quebec, Canada

Stenberg Mfg. Corp., Hoosick Falls, N.Y.

Stephens-Adamson Mfg. Co., 13 Ridgeway Ave., Aurora, Ill.

Sterling Cable Co. Ltd., Aldermaston, Berkshire, England

Sterling Electric Motors, Inc., 5401 Telegraph Rd., Los Angeles 22, Calif.

Stewart-Warner Corp., 1826 Diverser Parkway, Chicago 14, Ill.

Stewarts & Lloyds Ltd., 41, Oswald St., Glasgow, C. 1, Scotland

STILL & STILL CONSULTING MNG. ENG. & GEO., P.O. BOX 1512, PRESCOTT, ARIZ.

Stokes & Co. Ltd., R. O., 539 Salisbury House, London Wall, London, E.C. 2, England

STOODY CO., 11932 EAST SLAUSON AVE., WHITTIER, CALIF.

Strum Mfg. Co. Inc., 8383 Baldwin St., Oakland 21, Calif.

Stubbe, Albert, Vlotho-Weser, Western Germany

Stulz-Sickles Co., 920-939 Port Ave., Elizabeth, N.J.

Sturtevant Eng. Co. Ltd., Southern House, Cannon St., London E.C. 4, England

STURTEVANT MILL CO., 157 CLAYTON ST., DORCHESTER, BOSTON 22, MASS.

Superior-Lidgerwood-Mundy Corp., 100 Howard St., San Francisco, Calif.

SUTCLIFFE, RICHARD, LTD., UNIVERSAL WORKS, HORBURY, WAKEFIELD, YORKSHIRE, ENGLAND

Svenska Diamantbergborrnings AB, Stockholm, Sweden
SVENSKA MOTORBORR AB, STOCKHOLM-SOLNA, SWEDEN (SEE MOTORAMIC INC.)
 Syntron Co., 166 Lexington Ave., Homer City, Pa.

T

Tamping Bag Co., Div., Pickard Industries, Inc., 213 S. Third St., Mt. Vernon, Ill.
 Taylor-Wharton Iron & Steel Co., High Bridge, N.J.
 Techn. Ind. en Handelsonderneming, 81-89 Weteringschans Amsterdam C. Netherlands
TELLURIDE IRON WORKS CO., 400 MAIN AVE., DURANGO, COLO. of N.Y., The Sink & Float Div., 100 Park Ave., New York 17, N.Y.
 Tennessee Coal & Iron Div., U. S. Steel Corp., P. O. Box 599, Fairfield, Ala.
 Texas Co., 135 E. 42nd St., New York 17, N.Y.
 Texas Gulf Sulphur Co., Newburg, Texas.
 Texas Instruments, Inc., Geosciences & Instrumentation Div., 3509 Buffalo Speedway, Box 6027, Houston 6, Texas
 Thermoid Rubber Co., Div. H. K. Porter Co., 200 Whitehead Rd., Trenton 6, N.J.
 Thew Shovel Co., 23th & Fulton St., Lorain, Ohio
 Thiele, August G.m.b.H., Fabrik fur Ketten und Kettenforneder, (21b.) Kalthof/uh. Schwerts/Ruhr Western Germany
 Thom Ltd., John, Chaddock Lane, Boothstown, Walkden, Lancashire, England
 Thomas Flexible Coupling Co., Main Ave. & Biddle St., Warren, Pa.
 Thomas Laughlin Div., Am. Hoist & Derrick Co., 145 Fore St., Portland 5, Maine
THOR POWER TOOL CO., 175 N. STATE ST., CHICAGO, ILL.
 Throwaway Bit Corp., 4200 N.W. Yeon Ave., Portland 10, Oregon
 Thunes Mekaniiske Vaerksted AS, Box 225, Oslo, Norway
 Tide Water Assoc. Oil Co., 17 Battery Place, New York 4, N.Y.
 Timken Roller Bearing Co., The, 1835 Duerber Ave., S.W. Canton 6, Ohio
 Toledo Scale Div., Toledo Scale Corp., 1042 Telegraph Rd., Toledo 13, Ohio
 TOMCO Products Co., 5426 Schuhmacher Lane, Houston 27, Texas
TOOL STEEL GEAR & PINION CO., 211 TOWNSHIP AVE., CINCINNATI 16, OHIO
 Torit Mfg. Co., 1133 Rankin St., St. Paul 2, Minn.
 Tractomotive Corp., County Line Rd., Deerfield, Ill.
TRAYLOR ENGINEERING & MFG. DIV. OF FULLER CO., BOX 594, ALLENTOWN, PA.
TREADWELL CO., INC., M. H., 140 CEDAR ST., NEW YORK 6, N.Y.
 Trico Fuse Mfg. Co., 2945 N. 5th St., Milwaukee 12, Wis.
 Trojan Powder Co., 17 N. 7th St., Allentown, Pa.
 Trojan Powder Co., 620 Market St., San Francisco 4, Calif.
 Trombetta Solenoid Corp., 329 N. Milwaukee St., Milwaukee 2, Wis.
 Turbo-Maschinen A.G. Nusse & Grafer, Sprock-hovel, Westf. W. Germany
 Turner & Associates, 350 East Camelback Rd., Phoenix, Ariz.
 Twoo Prod., Inc., P.O. Box 666, 1458 S. Mosely, Wichita 1, Kansas
 Twedberg, Kleppe S.A., Av. Rio Branco, 25 P.O. Box 3144, Rio de Janeiro, Brasil
 Twin Disc Clutch Co., 1323 Racine St., Racine, Wis.
TYLER CO., THE W. S., 3615 SUPERIOR AVE., CLEVELAND 14, OHIO
 Tyson Bearing Co., Div. of S-K-F Industries, Inc., Oberlin Rd., Massillon, Ohio

U

Uddeholm Co. of America, Inc., 155 East 44th St., New York 17, N.Y.
 Uddeholm Co. of America, Inc., 5037 Telegraph Rd., Los Angeles 22, Calif.
 Uddeholms Aktiebolag, Uddeholm, Sweden
 Ultra-Violet Products, Inc., 5114 Walnut Grove Ave., San Gabriel, Calif.
 Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N.Y.
 Union Carbide & Carbon Corp., Hayama Steelite Div., 725 S. Lindsay St., Kokomo, Ind.
 Union Carbide & Carbon Corp., Linds Air Prod. Div., 30 E. 42nd St., New York 17, N.Y.
 Union Iron Works, E. 317 Montgomery, Spokane, Wash.

Union Oil Co. of Calif., 617 W. 7th St., Los Angeles 17, Calif.
 Union Wire Rope Corp., Subs. of Armco Steel, 21st & Manchester Aves., Kansas City 26, Mo.
 Unit Crane & Shovel Corp., 6411 W. Burnham St., Milwaukee 19, Wis.
 Unit Rig & Equipment Co., Box 1889, Tulsa, Okla.
 United Geophysical Corp., Box M, Pasadena, Calif.
 U. S. Electrical Motors, Inc., 200 E. Blauken Ave., Box 2053, Terminal Annex, Los Angeles 54, Calif.
 U. S. Hoffman Mach. Corp., 103-4th Ave., N. Y. 3, N.Y.
 U. S. Instrument Corp., P.O. Box 1191, Charlottesville, Va.
 U. S. Rubber Co., 1230 Ave. Americas, New York 20, N.Y.
 United States Rubber Int'l., 1230 Ave. Americas, N.Y. 20, N.Y.
 U. S. Steel Corp., 625 William Penn Place, Pittsburgh 30, Pa.
 U. S. Steel Corp., American Bridge Div., 525 Wm. Penn Place, Pittsburgh 30, Pa.
 U. S. Steel Corp., American Steel & Wire Div., Rockefeller Bldg., Cleveland 13, Ohio
 U. S. Steel Corp., Columbia-Geneva Steel Div., 120 Montgomery St., San Francisco 6, Calif.
U. S. STEEL EXPORT CO., 100 CHURCH ST., NEW YORK 8, N.Y.
 Universal Dredge Mfg. Co., 124 Wasee Market, Denver 10, Colo.
 Universal Engineering Corp., 625 C. Ave., N.W. Cedar Rapids, Iowa
 Universal Road Mach. Co., Kingston, N.Y.
 Universal Vibrating Screen Co., Deane Blvd. & St. Paul RR, Racine, Wis.

V

Vacu-Lag Tractions Tyres (Overseas) Ltd., Gonerby Hill Foot, Granton, England
 L. M. Van Moppes & Sons, (Diamond Tools Ltd.) Basingstoke, Hampshire, England
VAREL DIAMOND PRODUCTS CO., 2330 DENTON DR., DALLAS 29, TEXAS
VAREL MFG. CO., 2330 DENTON DR., P.O. BOX 13146 DALLAS, TEXAS
VARIAN ASSOCIATES, 611 HANSEN WAY, PALO ALTO 29, CALIF.
 Vascoloy-Rammet Corp., 300 Market St., Waukegan, Ill.
 Vickers-Armstrong (Engineers) Ltd., Vickers House, Broadway, Westminster, London, S.W. 1, England
VICKERS-ARMSTRONGS (TRACTORS) LTD., SCOTSWOOD WORKS, NEWCASTLE UPON TYNE 5, ENGLAND
 Victaulic Co. of America, P. O. Box 599, Elizabeth, New Jersey
 Vulcan Iron Works, Co., 730 S. Main St., Wilkes-Barre, Pa.
 Vulcan Iron Works Co., The, 2960 So. Fox St., Englewood, Colorado

W

Wagner Electric Corp., 6400 Plymouth Ave., St. Louis 14, Mo.
 Wagner Tractor, Inc., P.O. Box 7444, Portland, Oregon
 WAH Chang Mining Corp., Woolworth Bldg., 232 Broadway New York 7, N.Y.
 Walker Bros. (Wigan) Ltd., Parefield Iron-works, Wigan, Lancs, England
 Walker Machinery Co., 1545 Hanford St., P.O. Box 2427, Charleston 29, W. Va.
 Walsh Construction Co., P.O. Box 547, Oroville, Calif.
 Walvoord, Inc., O. W., 301 Detroit St., Denver 5, Colo.
 Walworth Co., 750-3rd Ave., N.Y. 17, N.Y.
 Ward Leonard Electric Co., 115 MacQuesten Parkway South, Mount Vernon, N.Y.
WARN MFG. CO., INC., BOX 6064, 18821 PACIFIC HIGHWAY, SEATTLE, WASH.
 Washington Iron Works, 1620 6th Ave. S., Seattle 4, Wash.
 Washington Machinery Co., 7329 East Marginal Way, Seattle 8, Wash.
 Waukesha Motor Co., West St. Paul Ave., Waukesha, Wis.
WEDAG, BOCHUM, WEST GERMANY
 Wedge Wire Corp., Wellington, Ohio
 Wellman Co., S.K., 200 Egbert Rd., Bedford, Ohio
 Wellman Engineering Co., 7000 Central Ave., Cleveland 4, Ohio
WEMCO, DIV. OF WESTERN MACHINERY CO., 650 FIFTH ST., SAN FRANCISCO, CALIF.
WESSERHUTTE OTTO WOLFF G.M.B.H., MINDENER STRASSE 14, BAD OEYN-HAUSEN, WEST GERMANY
 West Virginia Pulp & Paper Co., 35 East Wacker Drive, Chicago 1, Illinois
 Western Exploration Co., 8155 Redwood Highway, Novato, Calif.
 Western Gear Corp., P.O. Box 126, Belmont, Calif.

Western Insulated Wire Co., 2425 E. 30th St., Los Angeles 55, Calif.
 Westera-Knapp Engr. Co., 650-5th St., San Francisco Calif.
WESTERN MACHINERY CO., 650-5TH ST., SAN FRANCISCO 7, CALIF.
WESTERN PRECIPITATION DIV., JOY MFG. CO., 1099 W. 9TH ST., LOS ANGELES 54, CALIF.
WESTERN ROCK BIT MFG. CO., 553 WEST 7TH SOUTH ST., SALT LAKE CITY 4, UTAH
 Westfälische Maschinenbau G.m.b.H., Zecken-strasse 6-9 Unna, Westf., Germany
 Westfall Equipment Co., 437 No. Columbia Blvd., Portland 17, Ore.
 Westinghouse Air Brake Co., Cleveland Rock Drill Div., Cleveland, Ohio
 Westinghouse Air Brake Co., Ind. Products Div., P.O. Box 36, Wilmerding, Pa.
 Westinghouse Air Brake Co., Le Roi Div., 3716 W. Wisconsin Ave., Milwaukee, Wis.
 Westinghouse Electric Corp., P.O. Box 558, 3 Gateway Center Ave., Pittsburgh 30, Pa.
 Westinghouse Electric Corp., W. 55th St., Cleveland 2, Ohio
 Westinghouse Electric Corp., Lamp Div., Bloomfield, N.J.
 Westinghouse Electric Co., Sturtevant Div., Hyde Park, Boston 26, Mass.
WESTINGHOUSE ELECTRIC INTERNAT'L CO., 46 WALL ST., NEW YORK 5, NEW YORK
 Westeco Chemical Div., Food Machinery & Chem. Corp., 161 E. 42nd St., New York 17, N.Y.
 Wharton Engineers (Elstree) Ltd., Watford Road, Elstree, Herts, England
 Wheelabrator Corp., 1407 S. Brykit St., Mishawaka, Ind.
 Wheel Truing Tool Co., 3290 W. Davison Ave., Detroit 38, Mich.
 White Diesel Engine Div., White Motor Co., 1401 Sheridan Ave., Springfield, Ohio
 Wiggleworth & Co. Ltd., Power Transmission Engrs., Shipley, Yorkshire, England
WILD HEERBRUGG INSTRUMENTS, INC., MAIN & COVERT ST., PORT WASHINGTON, N. Y.
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Complete Mill Equipment

DENVER AGITATORS AND CONDITIONERS

3' x 3' to 50' x 50'

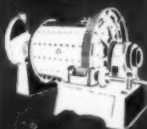


Heavy-duty as well as acid-proof construction is available. V-belt or enclosed gear-head drive available, also turbine propeller agitators for large tank, slow speed operation. New, high intensity rectangular agitator cells for flotation circuits are available. Write for Bulletin A2-B4.

New turbine type agitator gives best agitation at lowest horsepower.

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All sizes up to 10' dia. x 20' long



Cast steel heads, welded steel plate shells. Self-aligning oil bath lubricated trunnion bearings. Greater capacity since both diameter and length are measured inside new liners. Five types of discharge trunnions. Laboratory, pilot-plant and ceramic lined spherical mills for acid grinding also available. Write for Bulletin B2-B20.

Eliminate Risk - Use DENVER Grinding Tests

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2 1/4' x 3 1/2' x 36" x 48"



Cast steel frame, manganese jaw and cheek plates. Anti-friction pitman and side bearings. Highest capacity assured by extra long jaws with greater crushing area and forced feed operation. Uniform product size range controlled by easily adjustable jaw opening. Write for Bulletin C12-B12.

Most sizes always kept in Denver stock.

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1" to 10" Simplex and Duplex

Capacity to 1000 GPM



Ability to adjust stroke while pumping makes pump particularly valuable for metering volumes of liquid. Specially-designed nylon reinforced rubber diaphragm gives long life. Low head design. Anti-friction bearing construction. Optional Ball or Bayonet valves. Write for Bulletin P8-B12.

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2' dia. x 1 Disc to 9' dia. x 12 Disc



Special, patented segment design uses both gravity and vacuum to give thicker, drier filter cake, eliminate blow-back. Available with new exclusive, diaphragm-activated agitating mechanism in tank. Write for Bulletin F9-B5.

Maintains uniform particle suspension, even distribution of cake.

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16" x 16" to 72" x 72"



Simple, universal type tank can be converted from cell-to-cell flow to free-flow in the field. Three types of flotation mechanisms: (A) "Cell-to-Cell" (B) "Free-flow" and (C) Type "M" are interchangeable in universal tank. Denver "Sub-A" Flotation provides FLEXIBILITY of operation for greatest net return.

New "Free-Flow" type of Rougher Flotation

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A complete, reliable service consisting of: (1) testing your ore, (2) providing flow sheets, (3) designing mill layout, (4) providing complete mill equipment. Assures you the best, most practical and economical way to process your ore. Saves time and money, eliminates risk. Write for Bulletin T4-B21.

Proper test work eliminates much of the risk in mining.

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Capacity to 10,500 GPM



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16" to 60" Cutter Travel



Extra rigid track and ball-bearing wheels assure positive travel and timing of sample cut. Denver Vezin Type, Denver Snyder Type, or complete sampling systems available. Simple, accurate, low cost. Sampler mechanisms and cutters in stock. Write for Bulletin S1-B4.

Accurate sampling is as necessary as record keeping.

DENVER SRL SAND PUMPS

Up to 5000 GPM

In stock for quick delivery



Simple design, lighter weight and accurately engineered rubber parts increase efficiency 1 1/2 to 3 times over other sand pumps—lowers pumping costs as much as 40%. Molded rubber impellers and casing liners last up to 15 times longer. Glandless and mechanical seal types available. Available also as vertical sump pumps. Bulletin P9-B10.

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1' x 3' to 6' x 14'

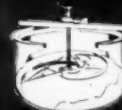


Gives fast, clean separation without blinding. Gives even, smooth flow of material because of patented "true-circle" eccentric action. Two bearing construction saves 50% horsepower over four bearing types. Suspended or floor-mounted units. Write for Bulletin S3-B15.

Simplicity, low maintenance and low horsepower.

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3' dia. to 150' dia.



Enclosed, running-in-oil mechanism, gear sizes to 72" diameter. High strength worm gear rides on oil bath lubricated, replaceable formica pads for maximum stability. Visual overload indicator. Spiral rakes move settled solids to center discharge with continuous motion. Wood, steel or rubber covered tanks available. Write for Bulletin T5-B7.

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WILFLEY *centrifugal* PUMPS

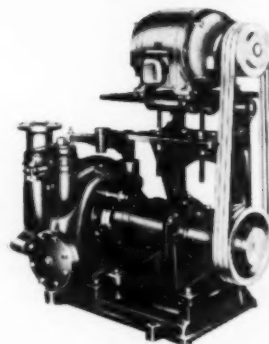
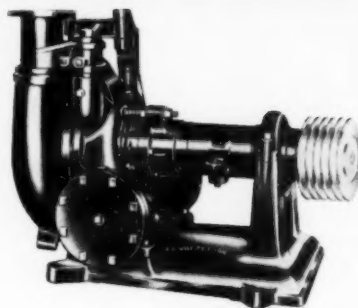


**INDIVIDUAL
ENGINEERING
ON EVERY
INSTALLATION**

The new patented WILFLEY MODEL "K" centrifugal sand pumps are designed for maintained high efficiency in rugged service and trouble-free operation. They combine the original WILFLEY principles with new improvements developed through years of engineering experience.

BELT DRIVEN, overhead V-belt driven and direct driven WILFLEY Model "K" pumps available in 1", 1½", 2", 2½", 3", 4", 5", 6", 8", 10" discharge sizes with capacities to 4000 GPM and heads as high as 200'.

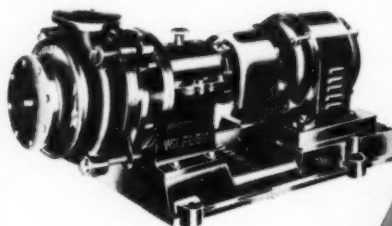
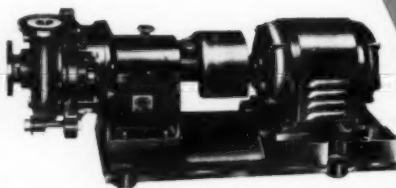
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